

CITY COUNCIL SPECIAL EDITION.

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Christchurch

Fair
Tree-set
“City
of the
Plains.”

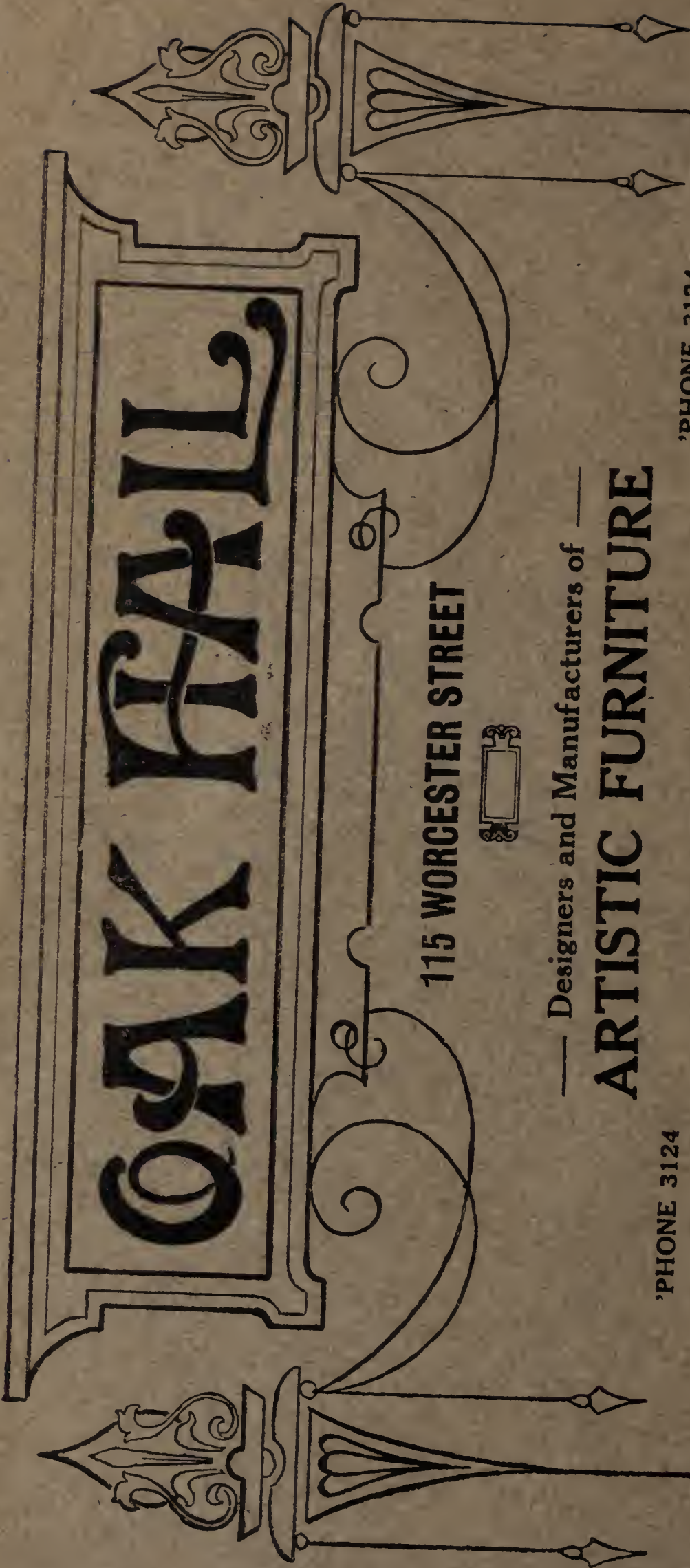


BEING SOME ACCOUNT OF
ITS PUBLIC AND MUNICIPAL
INSTITUTIONS.

BY ERNEST DENIS HOBEN.

From “The Familiar Unknown,” by “The Watchman,”
in the Christchurch “Press.”

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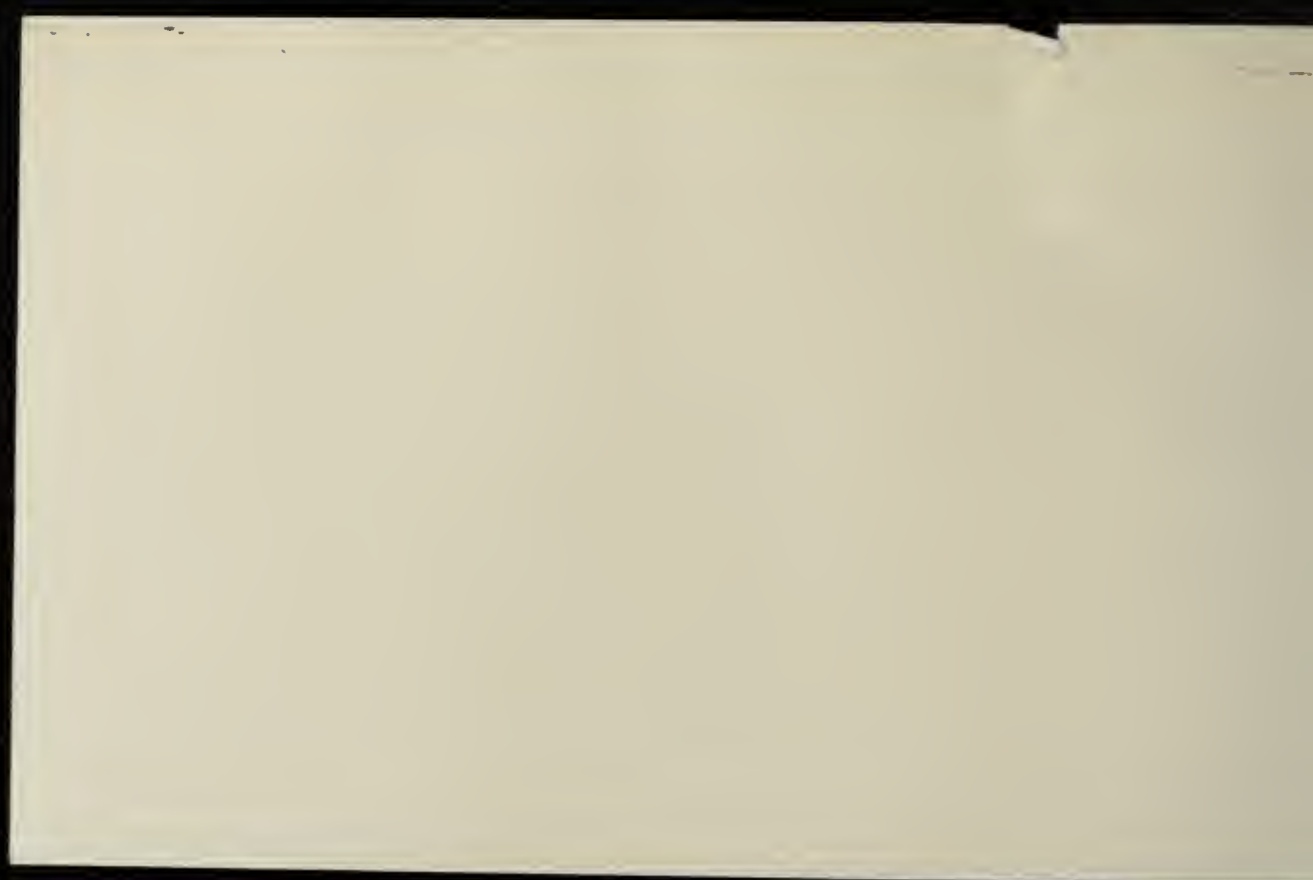
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*Christchurch,
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"THE MOST
FAMILIAR OBJECTS
ARE OFTEN
THE . .
LEAST KNOWN."



THE CATHEDRAL, CATHEDRAL SQUARE

The City of Christchurch



THE ROMAN CATHOLIC CATHEDRAL, BARBADOES STREET.

AFFECTIONATELY
KNOWN
TO ITS PEOPLE
AS "THE
CATHEDRAL CITY"
AND . .
"THE CITY
OF THE PLAINS."

CHRISTCHURCH, N.Z.:

PRINTED BY THE CHRISTCHURCH PRESS COMPANY LIMITED, CATHEDRAL SQUARE.

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EDITIONS.

CITY COUNCIL SPECIAL EDITION
DRAINAGE BOARD SPECIAL EDITION
FIRE BOARD SPECIAL EDITION
TRAMWAY BOARD SPECIAL EDITION.
FIRST PUBLIC EDITION.

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CHRISTCHURCH GAS CO'S HALF-CENTURY

There has always been to me a fascination in the remarkable fashion in which gas has met every assault made upon it, and by applying to its manufacture and utilisation the most acute scientific minds in the world, has "come up smiling" from every encounter with its great rivals. How often have we not been told that "gas shares would be a drug upon the market." They have continued to grow instead "more precious than rubies."



More scientific manufacture, development of by-products, such as tar once waste, the marvel of the incandescent mantle, and the whole series of scientific improvements it brought in its train for lighting, for heating, and for cooking, have simply enlarged the field of gas with every assault. Most colonials—men and women—can cook. If they can't cook, they should certainly hasten to the Gas Coy.'s cooking demonstrations and learn how, but probably no one has even realised how simple and how interesting cooking can become till they have tried it with the latest gas cookers. You can see them any day you step into the Christchurch Gas Coy.'s show rooms, in 77-79 Worcester Street, and be shown how to get the most delicious things out of them by the English expert, Miss F. M. A. Johnson, L.C.A., Silver Medalist, there on any Wednesday or Friday afternoon, from 2.30 to 4.30 p.m., and if people who say they cannot get adequate servants were to go there, and learn just how easy everything is with a properly convenience kitchen and gas cookers, and a gas iron and the rest, they would become philosophically indifferent to the vagaries of domestic industrialism.

The development of the Gas Coy. has been the development of Christchurch. It has been peculiarly fortunate in specially brainy direction, and the advantage of continuity in management. I give a picture of the head offices in Worcester Street as they are to-day, with their wonderful exhibition of the most up-to-date gas appliances, and of the site where they now are 52 years ago. Whenever anyone wants to know anything about old Christchurch, they go to Mr. R. C. Bishop, the Manager of the Gas Coy. He is one of the pioneers, as you will find when the various jubilees are celebrated, although nothing less than a certificate to that effect will satisfy a stranger that this hale, hearty and essentially "vital" man could be a veteran.

Well, in the *Sanctum Sanctorum* of the General Manager's room, Mr. Bishop will show you some really fine and valuable pictures of Christchurch as it was in 1852, when gas was an unattained luxury. The one reproduced shows the residence and garden of Dr. Barker, Surgeon to the pioneers of "The First Four Ships" bringing the "Pilgrim Fathers" and mothers of Canterbury, and where Dr.

Barker's residence was. the Christchurch Gas Coy.'s head office now is. Dr. Barker's residence is the left building, on the right is the Lands Office, occupying the site now occupied by the City Council Offices, of which I tell you in the first chapters of this veracious chronicle, and in the centre is the residence of Mr. W. G. Brittan, now replaced by the Clarendon Hotel, opposite where you stand when you are looking at the picture.



19 Ap '15 Z.T.

Dr. Barker. J

“THE CITY OF CHRISTCHURCH” UNLIMITED.

Treated as a BUSINESS FIRM in which its citizens are the Shareholders, being some attempt to show the detailed and intimate working of a New Zealand City to its inhabitants, who should, but, like citizens elsewhere, often do not know all about their own town.

The substance of these chapters appeared day by day in the series of “THE FAMILIAR UNKNOWN,” by “The Watchman” in the Christchurch “Press.” They are reproduced and brought up-to-date at the suggestion of the Municipal Bodies dealt with, and are now dedicated to anyone anywhere concerned with the practical working of Municipal enterprises (which should mean every citizen of every city) in the hope that they may find something of possible interest to them therein

By the Writer,

E. D. HOBEN.

CHRISTCHURCH, 1914.

How Christchurch is Governed.

CHAPTER I.

IN THE CITY'S HEADQUARTERS.

Half the world does not know how the other half lives, quoth Pantagruel, and the same thing was said before and since in different ways by different people. There is no proverbial saying truer. The obvious is often the least known. There are in London more people than there are in New Zealand who have never been inside St. Paul's, or Westminster Abbey, or the Tower. So it is the world over. The supposedly "familiar" things are often the least really familiar. You can't "see the wood for the trees," or, as the old English proverb has it, "Some men go through a forest and see no firewood." At any rate some men when they go forth into the wild places of municipal government see only Mayors or City Councillors, and other great and wonderful objects, and fondly believe that when their particular Mayors or City Councillors say that a particular footpath shall be, or a particular road will be, or some other thing for which the public yearns—well they just press the button and it is. As a poor pilgrim of the familiar unknown it occurred to me one day to investigate just what does happen when his Worship of Christchurch, or a Sage and Reverend Councillor presses a button, to see just what figure works, and how. Then I found "the other side of the button." I made my way to "where the bell rings."

WHERE THE BELL RINGS.

Really, the city is a big co-operative concern, with a Board of Directors, comprising his Worship and the Representatives of the Wards, elected by the shareholders, and under them a Secretary or Manager in the Town Clerk. Then the Heads of Departments, most of them experts, each devoted to his special branch of the business. The firm's head office, the place where the bell rings when the button is pushed, picturesquely situated by the Avon side, is singularly out of proportion to the big business the firm handles. If it were a private concern, it would be infinitely more imposing for the turn-

over. For, mark you, this business has a "turnover" of over three-quarters of a million sterling per year, handled in that small set of offices with an overflow accountancy department at 81 Worcester street, a Sanitation Branch, Motor Inspectors' Branch, an Electrical Engineer's Office in Gloucester street, and so on, but all dependent on the head office. Within the head office building itself there are the departments of the Public Office of the Town Clerk, the City Surveyor, the Rate Collector, the Inspector of Nuisances, and the clock that sets the time for Christchurch. Some of them, I am afraid, should lie low lest the Factory Inspectors find that they have not the statutory cubic feet of air space to the staff and the public that assembles to do business with them.

"POOR WANDERING ONES."

Here and there you meet men with books and documents, and a furtive, worried look, dodging along corridors. They are the Nomads. Like Poor Jo, they are ever being "moved on," or like the Arab they take up their books and walk—whenever somebody or thing of large size—like a Councillor or a Committee, happens along and wants their temporary refuge. The rabbits on the Port Hills have burrows, but not these. Some of them, too, may be quite large people, people whose time, and brains, and experience are precious to the shareholders, but they are "crowded out" all the same, because the Firm hasn't enlarged its offices with its business, so they seek to do their work in odd corners, and meeting rooms, till the corners or the rooms are wanted by someone else. And then they pray—so I am assured—for the great and glorious day when Christchurch will have a Town Hall and municipal headquarters commensurate with its business standing, and they will not have to change their spots more frequently than eight times in eight hours. And by way of refreshing their faded bones, they make pilgrimage to the Rate Collectors' office

wherein is exposed for wonderment and emulation a picture of the 56 storeys of the Woodworth Building in New York City. It is a picture sent by an American cousin to one of the Council's staff that he might hope for Christchurch to one day have to do its business in a head office at least, perhaps, a 20th or 30th part of Woodworth's. You may pity the poor Nomads who try to do their work without rest to the soles of their feet—but let your pity be canny, and help the Board of Directors to get their Town Hall, and all that it implies. It will pay you and the Firm.

THE CONTENTS THEREOF.

Take it for what it is, and as it is, and what does this head office hold?

Primus, there is the Town Clerk. Most people know Mr H. R. Smith. He is the first button that is pressed, the first figure that works when the Worshipful and collective municipal thumb goes down. On the one side are the fair and faithful type-writer experts, on the other the Public Office, presided over by the Chief Clerk. That is Mr J. S. Neville—and a couple of agile assistants. They have to be agile, because the only way to get in and out, unless by a long way round, is to jump over the counter—unless you crawl underneath. To keep the business pace going, they jump. There is no room to “take off” either, because when you have in a space about six feet square two sorrowing families desirous of selecting in private from separate cemetery plans suitable final abodes for their dear departed, five electors demanding to see if their names are on the rolls; four taxi-drivers, three dog owners, seven users of electric light, five publicans, sundry people with deposits re footpaths, and various sanitation contributors, all waiting to pay their fees and licenses; plus numerous ordinary enquirers about a thousand and one other things of personal and municipal interest—well, you may take it that there is what is occasionally called “congestion.” That, if it occurred in the Theatre Royal, for instance, would constrain the municipal inspectors to require rueful gentlemen in the box office to return the admission fees or take unpleasant consequences. Yet the picture, slightly “impressionistic,” is nevertheless descriptive of what happens when you try to put this big firm's business through one little space about the size of a (not too large) theatre box. Why, last year, they collected over the little counter £78,692—over £260 for each working day. And inside it, too, they have to count, be-

sides their “big” work, the pennies from the slot conveniences in the Square, the revenue from the municipal parcels office, the baths' silver, the proceeds of the carriers telephone by the river side, all sorts of flotsam and jetsam of tribute. How they do it all without calling in the Coroner occasionally is a mystery.

AFTER TWENTY-EIGHT YEARS.

Mr Smith became Town Clerk twelve years ago. The present City Head Office was built sixteen years before that—in 1885. It was built for the business of a municipality of 15,000 people. To-day it has to accommodate the business of 55,000 people. That is the number within the present City boundaries. There is a “Greater Christchurch” still beyond those boundaries, which brings the City population to 86,672. Presently a great part of this will be in, too, but as it is, the same offices of 1885—28 years ago—and the staff that can fit into them, or wander over them, has to do many kinds of gratuitous things for the 30,000 people beyond the City confines as well as the 50,000 odd in them. For when anything is to be done the Mayor and the Town Clerk are the natural trustees and executors of the people's will, whether it is a Scott memorial or a coal and blanket fund, or a battleship's visit, or an incursion of the neighbour's bairns from away down South. It all centres some way or another in the overcrowded head office on the Avon. Since that office was designed not only have Sydenham, and Linwood, and St. Albans, come in with all their sisters and cousins and aunts, but there have been several arrivals in the municipal cot, and all take out their benefits. The total receipts for the year the offices were built were £261,000 odd, and the expenditure £33,000 odd—a “turn-over” of £114,763, as a matter of fact. Last year the receipts were £387,309, and the payments £380,843, a “turn-over” of £768,000! I won't bother you with the extra hundreds and tens and units. Let someone else with the statistical itch look after the pence. How they ever manage to look after the pence with the little room they've got to do it in in Christchurch's own particular head office, is a mystery. It is much to their credit that they do. But it would be better for them and the shareholders if they were given more room to do it in.

MULTUM IN PARVO.

Here are some of the things they have to do in that multum in parvo of a crib:—Show the plans of the Linwood

and Sydenham cemeteries to those who come to select plots, and make all arrangements for burials on receipt of certificates. Deal with electoral rolls, and rate books, and perennial alterations in both caused through changes of ownership or changes of residence. Attend to licensing and registration of hackney carriages, taxi-cabs, motor-cars, motorbikes, dogs. Deal with payments for electric lighting and power, sanitary conveniences, fees for building permits, deposits on temporary footpath crossings, publicans' licenses, advances for sanitation, wholesale licenses, and the small beer already chronicled. What this involves in contact with the public alone you may judge from the simple facts that £78,692 was taken over that little counter last year, that there are over 1000 consumers of electricity to be dealt with every month, that last year 498 persons were buried in the Bromley Cemetery, and 225 at Sydenham, that is, more than two sets of grief-stricken people every working day. And it is a pathetic fact that there is no quiet spot to let them study the plans and make their arrangements out of the general hurlyburly. A sympathetic chief clerk contrived a little division on the counter—the same division that requires the staff to become acrobats—but even that wee pen is as often as not required by a dog owner or a cab-driver, or a man with a grievance about a footpath.

HOW THEY MANAGE.

And how do they do all the business inside the counter? Well—brains, system, and tickets. Everything in the Town Clerk's office that is reducable to tickets either has been, or is being, reduced to it. The cabinets lie on all hands and the cabinets never lie. Day by day tickets are added to and corrected and eliminated. Ticket electoral "rolls," ticket letter indexes indexed to writer and subject—about five thousand letters a year, and about 22,000 index references. And some subjects will have, perhaps, a couple of hundred letters under one head—the visit of the New Zealand for instance. Then there are big record books that record everybody's business "signs," everybody's graves, with the date and cause of death and date of interment, as well as the plots that folk have purchased

who have not yet qualified for their occupation. What the ticket system stands for you may gauge from the items that the district roll up to the date of the last mayoral election involved 24,968 names, and letter entries started in 1907 have reached some 27,000. Yet they have been so well kept that in the case of the electoral roll there was not one bona fide instance at last election of a name omitted where an application had been received, and in the "alterations" ticket drawer there are normally hundreds of entries since last roll ready for a new supplementary roll. Press a button and any name or fact in all this is available to each enquiring councillor.

THE FIRST MINUTES.

Then there is a whole library of minute books, bringing down the City's municipal history continuously since that first meeting on March 3rd, 1862, wherein Messrs G. Gould, G. Miles, J. Anderson, J. Barrett, W. D. Barnard, E. Reece, W. Wilson, H. E. Alport, and John Hall met to transact business. It was moved by Mr Gould, and seconded by Mr Wilson: That the aforesaid John Hall "be chairman of this Municipal Council." Carried nem. con. Mr Gould was evidently the organising head, for he moved also:—"That it appears to this Council that the following officers will be required for the proper discharge of the functions of the Council:—

1. Clerk and accountant.
2. Treasurer.
3. Collector of Rates and Inspector of Nuisances.
4. Legal adviser.
5. Consulting Engineer.
6. Clerk of Works."

The which was also carried nem. con.

Ah me! There are many memories to be dug out of these minute books of only half a century ago that range along the strong-room shelves. There are fewer "nem. cons." in the minutes nowadays, too.

And that staff, though it might not be very much out of keeping with the present office accommodation, would be very much out of keeping with the present work, in spite of the mechanical adding machine, and the weird and mysterious "millionaire," and the ticket system, and other aids of to-day to the doing of the work.

CHAPTER II.

THE RATES DEPARTMENT.

SOMETHING ON COLLECTING.

The Town Clerk's diminutive public office that took over £78,000 across its small counter in the past year isn't the only revenue-receiving office in the woefully congested Headquarters of the City Firm. There is another cashier's counter just across the passage, another department with its "fixed" and "nomadic" inmates. This is the Rate Collector's office, where Mr W. Smith and his assistants collected £124,486 last year. The "nomadic" folk in this office are the folk who are crowded out and have to wander with their work about the premises. Mr Smith you may find with his rolls and his figures "all over the shop"—wherever he can get a quiet corner. He is the General Collector, but there is also the Water Rate Collector, and there are two assistants, and one Checker. The last is a sort of perpetual auditor, always checking rates and calculations, chasing the 1d and 2d errors to their lair. His is the "infant" of the official positions, since it has only existed since 1912, and it is so effective that with some 86,000 entries of fractional rates the first balance will come out within a couple of pounds. There is an electric adding machine, too, that does amazing things.

RATES AND ROLLS.

In my voyage of discovery I ran the Rate Collector to earth in the Library upstairs—his temporary refuge to con over rolls. He has had 14 years of this sort of pedestrianism. How much work the rolls involve isn't always realised, and it would be more easily done if it could be done in one spot. The Rolls are on the Government valuation, but as the position stands now the rates for Hospital and Charitable Aid, the Christchurch Drainage Board, and the South Waimakariri River Board, which are all collected by the City Collector, are struck on the capital values, while the City rates are on the unimproved values—a rather awkward arrangement. This year, too, there was a special rate to be collected for the Tramway Board for the Burwood tram extension, and for the Cashmere tram. Then there are the "extra-water supplies" to be collected for, in addition to the rate figures quoted, so that the Collector's hands are full.

MAKING THE VALUATIONS.

The Government valuations are made every five years, and a new one is to be made this year. Then there will be the usual set of people who will disregard the notices they will get about the values, and the other people who will be furious because the values are raised—indignant if you offered to take the place at the valuation they object so strenuously to. Then there will be the people who really won't get the notices because they didn't trouble to notify changes of address, and the Government Department doesn't trouble any further about notices that come back undelivered. That is the addressee's trouble.

MAKING THE ROLLS.

When the Government Valuation rolls come rolls have to be made for the City Wards—Central, Linwood, St. Albans, Sydenham. The basis of these is five Government rolls for St. Albans, five for Central, three for Sydenham, two for Linwood—about 14,000 separate valuations. Exempted properties have to be taken out, and when the Ward rolls are made they have to be adorned with various cabalistic signs, representing "classes." Thus "S 23,000, Class 2," means that the property is under the £23,000 loan, and the Waimakariri River Board. "X S 23,000, Class 1," that it is also liable for a £27,000 Drainage Board loan rate, representing £27,500, which the City Sewerage Area had spent in excess, and which belonged to the "Rural" area. Then there is "X C S," which is under the "pan" system, and pays a uniform fee, and "X sewerage to £3000" for concrete channelling in some parts of St. Albans, and "R 3000" covering the same area, but without sewers. The "Rural" area only pays $\frac{1}{2}$ d in the £1 on the unimproved value, instead of $\frac{3}{4}$ d in the £1 on the capital value, as under the sewerage rate. Then there is "R No. 3 loan, £11,500," also a concrete and channelling loan, and "S 23,000," and "R no loan" where the vendors of the properties did the channelling and paths themselves. "J D B," and ever so many more.

RATHER COMPLICATED.

So that you can see that the rate rolls by the time the Rate Collector has

marked them up, are full of mysterious signs and tokens, and symbols, all dealing with the £10,739,390 of rateable capital values, and the £4,402,955 of "unimproved" values, which the valuers place on the properties within the City of Christchurch. There are ever so many further differentiations from the different locality loans for special purposes, some of them overlapping from ward to ward, and covering various services, some localities having two or three to be considered, and all these separate properties affected by these numerous loans and rates have to be separately marked and taken out to be dealt with according to their quota. So that the rate roll isn't at all the simple thing that the average ratepayer imagines.

GETTING THE CASH.

When all the symbols have been set down and sorted out and the rate notices go out, then there is six months' grace given for payment before 10 per cent. is charged on all unpaid. That is followed by notice to sue, and last year from 400 to 500 were sued. After six months the defaulting properties can be sold, but the mortgagees generally intervene in the case of house property. In cases of extreme poverty the Council has power to remit rates,

but there are very few cases where they are remitted. Sometimes the collector goes out and "shakes" some folk up, but it is usually the "good" but dilatory "marks" who are thus shaken. There would be no time to go around the others.

PRO BONO PUBLICO.

It seems, though, the others come themselves occasionally. We haven't suffragettes here, and "conscientious objectors," and "passive resisters," to the rates, but there are occasions when excited females call at the office, and then the business has to stop. For with the sort of accommodation, or lack of it, there is no room for business and an excited female too. And as the unfortunate collector has no room where he can calm the excitement away from the public view and ear, no room where he can discuss intricate points that the interested parties don't want discussed pro bono publico, once more the deficiencies of the head office make the business of the firm that has grown ever so much too big for its house, suffer—and the shareholders suffer with it. Of course no private business would leave its department managers so little facility for doing its business quietly and smoothly.

CHAPTER III.

THE ENGINEERING BRANCH.

WHERE THE MONEY GOES.

Having escaped whole from the congested districts presided over by the Town Clerk and Rate Collector, the venturesome explorer of the city's counting-house may turn in, as I did, to the door bearing the sign of "The City Surveyor," and indicating the head office of the department that does the work and spends the money the other two have been diligently getting in. Here it is that the bell rings loud when that particular bit of road, or footpath, or drain, that you have been importuning your ward member to get done for you, has successfully run the gauntlet of the Works Committee and the Council. Again, you are struck by the disproportion between the work accomplished, the large interests involved, and the accommodation provided for designing and supervising it all. Here, in this little corner, smaller much than the offices of many

an engineer in ever so much smaller practice, Mr Dudley Dobson, C.E., handles the really big engineering and construction and maintenance business of the City of Christchurch. Here he and his staff, consisting of Mr C. Dawe, assistant engineer; Mr Batten, paymaster and building inspector; a clerk in the office (and a clerk in the Central Yard) deal with the executive and designing and business side of all the public works of the city—with the roads, the water supply, sanitation other than the laying of sewers (which is the work of the Drainage Board), any work arising from the operations of the health officers of the Council, gardens and parks, looking after the lighting and putting in new lamps, the control of buildings, and so on. At the Water Works, Mr Barker is the engineer in charge, and Mr Scott is the controlling genius of the electrical department.

THE SAME OLD STORY.

How the work that is done in this office of the City Surveyor or is conducted so satisfactorily as it is, is another of the reiterant mysteries of this outgrown nest of the City Firm. If a draughtsman has to work on plans he has to hunt temporary refuge in committee rooms, perhaps to be speedily ejected. One little desk about six feet long, in a passage, is the only accommodation there is for contractors to set out and examine plans for intricate works. In fact there is really no place to spread a plan out, and persons who come to see the city engineer have to wait on the doormat—if there is more than one of him. There is no place for them to sit down and wait if there is someone already in, and if something supremely important happens, like the advent of the Secretary of a Union or Royalty, or a City Councillor, or a Minister of the Crown, and there are already two or three mere rate-payers engaged with the Head, then there is nothing for it but to empty them out to let the bigger fellow come in. It would facilitate matters should it be found impracticable to give better business buildings, to have a shoot out into Worcester street, through which the superfluous, though unfinished, visitor could be shot with neatness and despatch, and with as little pain as would be consistent with business promptitude.

SOMETHING LIKE IT.

In fact all through this head office of the City Firm I am reminded of an hotel which used to be in a remote part of the Bay of Plenty. The landlord's ideas of style were larger than his rooms. If a longish guest arrived he found that the only way to accommodate himself in his bedroom was to thrust his feet out the window. As the mosquitoes were very bad he soon learned to keep his boots on. In the morning the prospective duke, who temporarily officiated as "Boots," used to come round, shut down the window to keep the living lasts firm, and polish the boots on the feet of the guests. Occasionally a guest who had not been in the stocks before he came to this country, or a guest to whom the process was too reminiscent, is said to have protested. But the system, I am told, worked without an excessive number of fatalities.

BAD BUSINESS.

Excuse my getting back to this space and facilities question, but when you see the wastage of time and work it

involves, and have seen what a private concern would do in the same circumstances, on more modern business lines, the subject does keep cropping up in spite of yourself. For this city surveyor's office handles work that runs into an expenditure of something like £56,000 a year, and you will find a hundred concerns in Christchurch not handling a tenth of that outlay with better facilities in the way of office accommodation than this one of your own. The city surveyor himself had much better facilities when he was in private practice, and time and inconvenience mean money—which comes out of the "shareholders'" pockets. Mr Dobson fortunately had a very wide experience. His father was Provincial Engineer here and the son had experience with him and with others. Then he had twelve years' experience as a contractor in a big way in Australia, and more private engineering practice. He has been running the present concern for twelve years. A man who has had all that private experience makes shift with what he has to hand, though if it were his own business he would make sure that there was more space to shift it in.

THE WORK COVERED.

Some idea of the work that is done in the office may be gauged from a recital of a few of its divisions. There is the matter of building permits, for instance. For every building put up in Christchurch a building permit has to be got in this office. Before the permit is granted the officer in charge must be satisfied that the plans are in accordance with the by-laws. Even a little coal-shed or wood-house, or a verandah, to be put on an existing place, has to be considered. There were 431 building permits issued last year for £261,000 worth of buildings, and people come several times in connection with the one matter. First they want to know what the by-laws are and how they are to proceed, and whether the material that the hen-house is to be erected in is all right, and a dozen other things. Then they want to know what they want—often. Very particular people who are considering the hygienic side of the coal-house, or the best aspect for the hen-rery, may make many visits and many enquiries. With mansions and big business houses it is not so bad, because usually they are in the hands of expert architects, who know the by-laws—or ought to—and then it is mainly a case of considering technical points. But you imagine just how much time and trouble those four hundred odd permits have involved. And

that is only one of the minor items of the work of the office.

There is the matter of the streets and roads, and the payments for all work done, this last being done through the paymaster—a process that can be explained when it comes to exploring the accountancy department. For the streets and roads the operative staff is organised on the ward basis. There are four wards, each with a foreman, who reports daily to the Engineer, and receives his instructions from him fortnightly as to work done. Each foreman has his gang. A typical paysheet read:—Central Ward 80 men, Sydenham 23, Linwood 15, St. Albans 26.

Those were the men dealing with the thoroughfares and everything appertaining to them, but on the pay-sheet were also—cemeteries 3 men, reserves and gardens 23, baths, conveniences, carriers' telephone, charwomen, 13.

Then there are at the waterworks, under Mr Barker, four engineers and four stokers, and a fitter, and for outside waterworks about ten men.

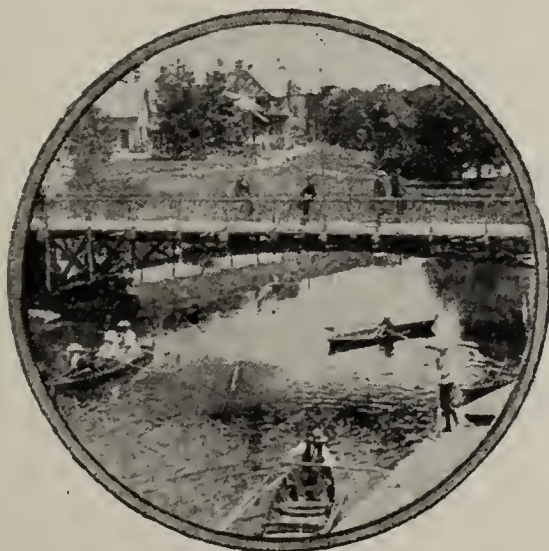
Mr Smith has 40 men at the abat-toirs, and Mr Scott has the electrical staffs.

The office deals generally with all constructive work, and all mechanical work, machinery, roads, and drainage, besides the specialities mentioned.

At the cemeteries it is responsible for all the surveys of plots, and for seeing that no one can complain of not having been well planted. In fact, while the department by looking after the drainage and destroying all sorts of insanitary things and condemned food, and the rest, and keeping the destructor going, does its best to keep citizens out of the cemeteries, if after all they make their way thither as residents, it does its best to see that the last home is seemly, deep enough, and not too damp.

PRESSING THE BUTTONS.

How the buttons are pressed in regard to the execution of the works is something in this wise:—The Council meets once a fortnight. It is divided into various committees, but those the City Surveyor's department has most particularly to do with are the Works, Sanitary, Gas-lighting, and Quarry Committee; the Electrical Lighting and Power Committee; Water Supply Committee, and in certain ways with the By-laws, Finance and Departmental Committee. Each of these committees sits before the Council, so as to report to it on any matters submitted to them. The committees also receive the reports from the City Surveyor's department on all works submitted, proposed, or in progress, and in turn report to the Council. If the Council approves of certain works being carried out, it presses the button and the department sets about doing the rest, which involves, of course, a great deal in the way of plans and specifications, and contracts and investigations, and instructions and research, as well as supervision of the carrying out of those instructions. Finally, from the foremen's fortnightly reports, his own investigations, and the correspondence and work of the staff, the City Surveyor's report to the Council is made, and so the circle is completed once more. What the supervision and the execution and the handling stand for may be in part realised by remembering that this firm makes or keeps in repair 143 miles of roads and streets, and looks after 132 miles of water-main reticulation. It pumped nearly four hundred and four million gallons of water through those mains last year, which would indicate a pretty tidy consumption on the part of the people of Christchurch, even though one irate gentleman told me the other day that they didn't drink half enough water here.



CHAPTER IV.

ABOUT THE WATER SUPPLY.

THE WATERS UNDER THE EARTH.

Of all the responsibilities which the City Surveyor carries on his shoulders for the City Firm, the most important are the water supply and the roads. For the water supply, Christchurch is abundantly blessed by Providence with the wonderful gift of the artesian. If it were not so, we would be bringing water at enormous cost from the mountains. As it is, Nature brings it along for us, puts it through a natural filter bed on the way, and lands it right under the city for the Firm's employees to simply put down a pipe and a pump, and send it far enough up again to make it run down quick and hard of its own weight to the town. The secrets of this artesian supply are full of interest. Apparently we are in an old river-bed of the Alpine-ice fed Waimakariri, which has brought down shingle from the glaciers, as the attrition of the once still greater mountains has gone on through the ages. How much shingle it has brought no man can tell, but dig five hundred feet down and it is shingle, and perhaps a thousand feet. That has taken some shifting in the ages past. Between the Waimakariri and the Selwyn is this great bed of shingle below the fertile and beautiful Canterbury Plains, home of the "Prime Canterbury" mutton that has become world famous, and in all that area not one important river to carry away the rainfall and the always percolating torrent of the so-appropriately-named "Very Cold Water" from the glaciers of New Zealand's mighty back-bone. At Harewood, for instance, the Waimakariri waters are not twelve feet below the surface. How much further they extend we know not.

NATURE'S HUGE RESERVOIR.

There is sixty to seventy square miles of plain without a surface river that counts, and in that area springs rise in divers places and feed the Avon and the Heathcote, and bubble out at the Lake. They used to rise once through great mounds of "niggerhead"—natural artesian. There is from 26 to 30 inches of rainfall to carry away every year. Apparently all this heaven-sent water goes into the vast shingle bed, and flowing towards the sea, makes a water supply for the people of Christchurch, held in

a huge perennially replenished underground storage basin. Lucky folk of Christchurch.

It is such an easy supply to come at, and so good when you come at it. In Australia, where the wonderful artesian basin stores the rainfall from the western side of the Dividing Range and holds it to make possible the occupation of what was once erroneously called the "Dead Heart" of the continent, the water dives deep down to the very bowels of the earth. It has to be sought at depths like 3000 feet, and when it comes up it is boiling, and sometimes so brackish or so charged with mineral that it has to be allowed to run considerable distances and precipitate its charges before stock will take it. A fine asset to start a thermal springs district with, as has been done at Moree, for instance, but not to supply a city. Here the water is good for man and beast as it comes out of the earth, and it is to be got at anywhere.

UNDER THE HILLS.

Out under the shadow of the Cashmere Hills is the main source of the water supply of Christchurch, and it is on to a spur of the hills, 250 feet up, that it is pumped, to flow down again and give a pressure of 108lb to the inch in the Square. It all comes from four artesian wells, two of eight and two of six inches, down only eighty-five feet into the shingle, and flowing into a large receiving reservoir behind the pumping station. They flow so consistently and well that last year (that is, up to March 31st last) the town was able to consume 403,340,000 gallons without a strain to the works. Something over five thousand gallons of moisture for every man, woman, and babe in the town—and possibly that was not the only moisture some of them consumed, though it may, of course, be that it was not all "taken internally." All day and every day those silent forces of Nature are sending the supply bubbling up for us whether we sleep or whether we wake, and the waterworks staff is vigilantly watching over them and handing the beverage on to where it will do most good. Down where the water is coming from was either a forest or an old river-bed full of trees washed from a forest, for there are big

totara trunks through the shingle. They may have been there for centuries, but they are still quite sound.

IN THE POWER HOUSE.

Inside the power-house everything is spick and span, and everything tells of efficiency. There is a pumping plant designed to pump seventy thousand gallons per hour against a head of 270 feet. The Cathedral spire is about 210 feet high, so that the pumps in filling the hill reservoir, are pumping some 60 feet above that.

There are two gas producers, Crossley's, each of 116 h.p. capacity. There is a new set by Scott Bros., a 250 h.p. plant. Unfortunately it has been made the subject of litigation. There are two Worthington 116 h.p. pumps running 1200 to 1400 revolutions per minute, and a capacity of 850 gallons every minute against the 270-feet "head" aforementioned. Then there are a couple of small gas-engines for grinding coke, starting the big engine fly-wheels with compressed air, and so forth. There are oil tanks and filters in which the City Firm prepares its own oils—a very important thing. As a matter of fact the Firm does quite a lot of things here. It does all its own forge work and repairs, and has wisely decided to have nothing but the most competent men, well capable of doing it. Mr Barker, the head at the station, is an ex-Canterbury College engineering school graduate. Mr Melish, his lieutenant, also. Both hold marine chief engineer certificates, and have had wide experience of the highest value at sea and on land, and the rest of the staff are likewise of the best. That is the wisest policy that the Firm could adopt, because it saves many a hitch and many a heavy expenditure that might be involved by doing with men of the "cheaper" type; and one hitch would eat up lots more than the difference. The perfect order of a plant designed for 1,200,000 gallons a day, and that has done comfortably its two millions on hot dusty days, is testimony sufficient for this.

"KNOWING CRITTERS."

But it isn't only the big pumps and the like that are so interesting in this station. One of the most interesting corners in it is the glassed-in office, where stand the machines that tell

about the work that the pumps and the men are doing. There is a clock face, for instance, that tells all about the rise and fall of the water in the reservoir. There is the Venturi Water Meter that once upon a time would have been burnt for witch-craft, for it goes on quietly ticking and writing on its sheets just the amount of water that is being pumped every minute through the pipes and mains, and just when and how the stokers stoke the furnaces of the gas retorts, making a record for the City Surveyor to see—"keeping tab" always, and never getting sleepy over it.

A HANDY STAND-BY.

The City has, besides this station, another at Sydenham. It is one of the things Sydenham was doing when it decided to come into Greater Christchurch. Mr Dobson had the work in hand, and he finished it into a very fine little stand-by plant for emergency, which has proved its value exceeding well by supplying Christchurch while alterations and repairs were being made. Here there are two wells running into a reservoir, and two Gould piston pumps, and an "Invincible" centrifugal pump, that when they are called on send their 35,000 gallons an hour into the City mains. Like the rest of the water-works plant, it is kept always in first-rate order, but closed down when it is not wanted. It is very comforting to know that it is there all the time—ready to jump into collar when the call comes. It will also be comforting to know that with the new plant going that we are able to keep an entire plant as stand-by at the Cashmere pumping station, and switch on from one to the other while one is being overhauled. It is quite refreshing to go out to the Cashmere station and find everything so well thought out, and such room and facilities for doing whatever is needed, whether it is taking in coke, grinding it up to make producer-gas, supplying the town with water, mending anything that may break, and making anything (short of castings) that is required in the every-day work, giving the men a warm bath when their work is done, or lifting big chunks of machinery round the premises with an up-to-date overhead crane that whips a five-ton lump of steel and iron about as simply as you would a ten-pound weight.

CHAPTER V.

THE CITY'S STREETS.

HIGHWAYS AND BYWAYS.

There are 143 miles of streets and roads in the Christchurch municipality, and the whole work of construction and maintenance is done by day labour under the City Surveyor. There is a foreman to each ward, and 80 men in the Central Ward, 23 in Sydenham, 15 in Linwood, 26 in St. Albans, are a typical week's figures. Material is supplied by contract. Now, everybody in Christchurch uses some of these streets every day, growls if they are too dry and dusty, or too wet, or "up" for repairs. Yet how much do they know of them?

TAR-TOPPED.

To me the most interesting section of all the 143 miles of streets and roads is the eleven and a quarter miles that are tar-topped, and five miles 52 chains of which is constructed of tar-red-macadam. Mr Dobson has developed something decidedly good here, something that other places enquire about, and other people come to see and admire. The late Mr T. E. Taylor, as Mayor, contemplated a big extension of those eleven miles in his road scheme. Mr Holland and the present Council favour their steady extension. What strangers think was shown recently when Mr Deane, a prominent citizen of British Columbia, was visiting the Dominion. He heard of those eleven miles, and came to Christchurch to see them. As a result he said he was very sorry he had not seen them sooner, because he might have saved his own city £90,000 if he had. In Victoria, B.C., they had just let £100,000 of contracts for wood-blocking at 15s to 16s per super yard, and now Mr Deane is quite satisfied that the system developed in Christchurch, as the result of the City Surveyor's experience and study of other men's systems in other countries, would suit them better. The difference in cost is startling. The fine section put down in Park Terrace in 1911, for instance, cost under 1s 6d per super yard. It was put down on top of worn-out, water-bound macadam, which was scarified, rolled, and the tar-metal put on top. The highest cost of any such work in Christchurch so far has been 3s per yard where it was put on extra thickly alongside tramlines. If it is to

carry extra heavy traction, it costs 2s 6d per yard.

SOME STRIKING CONTRASTS.

Contrast that, not merely with the British Columbia figures, but with the latest Australian figures.—In Sydney wood-paving or asphalt cost from 17s 6d to £1 per yard, and they don't reckon more than 20 years life to the wood block. In Moore street, in the banking and professional quarter, near the Sydney G.P.O., the wood blocks have practically seen their life out in 13 years. In Kent and York streets, centres of warehouses and heavy lorry traffic, and hill-side streets, the wood blocks have become like cobblestones in much less time than that, and once wood blocks get irregular so as to hold water, their time has to all intents and purposes come. Here are the Christchurch tar-topped costs by way of comparison and record: First section in Armagh street, 1s 9½d per yard, 3 years down; Durham street, 26 chains, 1s 5d; Moorhouse Avenue, 13 chains, 1s 9d; St. Asaph street, 33 chains, 1s 3½d; Park Terrace, 1¼ miles, 1s 5½d. The results you can see for yourself.

TAR IN THE FAMILY.

This tar business is curious. It happens to be hereditary in Mr Dobson's family seemingly. Perhaps you may remember a tar-paved yard in Lyttelton Gaol? No? I have heard of folk who "can't abear" a tarred street to this day on account of it. Well, Dobson pere came from Nottingham where tar was being used for footpaths, and as Canterbury's Provincial Engineer, put this yard down in the gaol, it is said to have been the first tar pavement here. That was in 1850. It was years after one Eden George, as Mayor of Christchurch, set about tarring Cathedral square. He had the idea all right, but didn't know how to go about it. You will remember Mr George? A most enterprising citizen who perhaps was not quite so generally appreciated as his enterprise deserved. When the Cathedral spire lost its top in an earthquake he, I was once told, wanted to restore it at his own expense, provided the business of Eden George was emblazoned thereon. And the business was photography. As Mayor the Councillors didn't exactly

welcome him, and he sorely worried Ministers with the needs of Christchurch. Afterwards he cast this ungrateful dust from his feet.

A HOUSE OF ASHES.

In Sydney the ex-Mayor of Christchurch rapidly developed a big advertising photographic business, made a fortune, financed the Liberal Party, got into Parliament, and at Manly built a residence that set the visitors to that famous surf-bathing resort gaping. It was a big structure, and he set about building it of ashes—ashes from the ferry steamer furnaces, which he made into a sort of concrete in moulds by "day labour" under his own personal supervision. The men had "a steady job," so to speak. The house took so long to build that people used to pay monthly or semi-annual visits to see how it was getting on. Also the ex-Christchurch-Mayor didn't agree with the Manly Mayor as to the supply of water to mix his ashes, and, apparently imagining he was back in Christchurch, erected a pumping plant near a "spring" in his grounds, and pumped the "spring" dry for ever in a few hours. But in the end he "got there." And that's why his tar crusade recalled the other. He didn't know how to apply the tar any more than he knew, when he started, the right way to build mansions of ashes, but he built the house, and another big house after it, and someone else in after years was to take up the tar business for Christchurch and make it thoroughly practical. Mr Eden George merely "painted" Cathedral square with tar. He might almost as well have used blacking.

THE QUEERNESS OF TAR.

For tar is a mightily queer thing. A good many people imagine that to make a tarred street successfully you have only to get a barrel of tar and pour it on, spreading it a bit with a brush or letting the casual citizen do it for you with his feet. To tell you all about coal tar would take volumes. There are hundreds of books on it to which you can refer if you wish, but as I remember the essential elemental facts they are something like this:—Back towards the close of the Eighteenth Century one of the fighting Earls of Dundonald discovered that from coal could be got a tar that would help to preserve his fighting ships, and he began the distillation of coal in Scotland to make tar. When gas began to be made from coal it was found that by varying the process you could make a lot of gas and a little tar, or a lot of tar and a little gas. Tar, however, soon

became a waste product. They used to burn it up to heat the gas retorts, or mix it with small coal or sawdust to make patent fuel. Presently they distilled it, producing oils and heavy tar and pitch. Then they began to find out extraordinary things about tar. It was discovered that when you began to boil it in a still it threw off volatile substances as the temperature increased.

ALL IN THE BLACK STUFF.

First came gases, benzol ammonia, and naphtha. Then more oils lighter than water. Then creosote oils, finally anthracene oils. The residue was pitch. From the first light oils came benzol, carbolic acid, naphtha. From the creosote oils creosote, and naphthaline. From the anthracene oils, anthracene and lubricating oils. The naphtha is used to dissolve india-rubber and gutta-percha, and burned to produce fine carbon for printing ink. Benzol yields brilliant dyes, and as benzine cleans all sorts of things—and incidentally sometimes sets fire to the users. Creosote crude is used to preserve wood, and its smoke yields lamp-black. Naphthaline produces a whole range of dyes, and in albo carbon makes coal-gas give very brilliant light. Then from these products of coal-tar distillation come the analine dyes, quinine substitutes like the anti-pyrin, anti-febrin, sugar substitutes like saccharine, articles in common use like ammonia, and the pitch makes roofing felt and asphalt pavements.

DON'T WANT THEM.

There are scores of other things, if one could only remember them, and their enumeration were needed, but the point is that the City firm doesn't want to make headache cures, or candy, or sleeping tablets, or disinfectants, or lubricating and illuminating oils. All these things are in tar, and people who want to make them get them out of it, but they spoil it for the purpose for which we want the tar here—for making tar macadam for the streets. For that it is the residual pitch that is needed. The City Surveyor having proved how good tar is for the streets when he gets the right thing and applies it the right way, asked the Firm to get him a distilling plant so that he could make plain pitch.

USING IT EVERYWHERE.

In England great businesses have been built up in stuff they call "tar-mac," and "tarmite," and the like, which is the distilled residue, properly seasoned. All over Europe, engineers are making "tarred" roads.

and they prefer these preparations because they know they can rely on them. In America tar roads have long been made. It was customary in that country to present prominent citizens with a coat of tar and feather overalls—that was before feather beds gave way to kapoc and spring mattresses. Perhaps some citizen noted the resistance of his tar coat to removal, and concluded it would stand traffic on the roads. At any rate, they put it on the roads now, and distil it first. When our City Firm began to use tar it was a waste product, selling at 2d a gallon, and had been so long in the gas-works tanks that the lighter oils had evaporated. Pumped from the bottom it was “ripe.” Now the supply cannot overtake the demand, and it is pumped out fresh.

VALUE OF THE STILL.

The Tarmac people take their tar, prepare it and then let it ripen for ten months while the oils go on evaporating, leaving the pitch. But

these preparations, which cost 10d a gallon in the Old Country, would cost 1s a gallon here, and the Firm could do it for itself as well. Put new tar on your road, and the evaporation goes on there instead of in the still, and when the oils are gone your tar road is gone, too. A still costs about £600, but it is a good investment, for our tar-topped roads have been such a great success that we should extend them just as far as we possibly can. They seem to suit the climate, they give a fine surface for traffic, they preserve the roads. What water “binds” water finds and washes away. But water cannot penetrate the tar top, and so the washing away process is stopped. Once upon a time hundreds of tons of mud had to be carted off Christchurch streets. There is no mud on the tar-tops. From every point of view the Christchurch system for those eleven miles out of 143 has “made good.” The shareholders ought to insist on that eleven miles being indefinitely multiplied.

CHAPTER VI.

FROM FOULNESS TO LIGHT.

THE ELECTRICAL DEPARTMENT.

The electrical department of the city's business is presided over by one of those hard-headed Otago Scots whom you meet in so many engine rooms, one J. C. Scott of that ilk. He is the man who runs the present department, and is getting ready for the ever so much bigger department we will have after May 1st next, when the Government has undertaken to turn the Lake Coleridge supply into the city's mains. As it is, the business is steadily growing. There are over 1000 consumers of light or power now, a little over 600 of them being for light, the rest for power, the total number of connections to March 31st, 1913, equalling 49,350 lamps of 60 watts each. The year's revenue from sale of current light was £11,242, power £6710, and the total revenue of the department for the year £20,030, against an expenditure of £11,634, of which over £6000 was for fuel. That showed a gross working profit of £8395 odd, and after £3700 of interest and sinking funds, and over £2500 for depreciation is deducted there is still the substantial balance of £2107 from the year's working to go in reduction of overdraft. The outfit, land, buildings, plant, etc., stand at a capital cost of £54,558.

FROM RUBBISH TO LIGHT.

It has to be remembered that the above figures include the destruction of the rubbish of Greater Christchurch. The electricity is generated by the burning of the rubbish plus whatever coal may be necessary to bring up the power. Coal is not used with the rubbish itself except in the case of such unpromising fuel as fish. There are two 250 h.p. boilers at the Armagh street establishment, in which steam is raised by the rubbish destructors, with the assistance of coal when necessary, and two 500 h.p. boilers supplied by coal alone. So far, only the rubbish of the Christchurch municipality is burned—16,396 loads of it during the past year, of which the Central Ward contributed 10,696, Linwood 1100, Sydenham 1763, St. Albans 1192. Then there were 928 loads of fish, and 717 “special” loads of miscellaneous rubbish from private concerns, which the owners paid for the destruction of. That represented 251 loads more rubbish for 1912-13 than for 1911-12, and the plant as it stands can do no more. If it could, there are more bodies outside Christchurch that would come in, and save the wretchedly unsightly “rubbish tips” that are to be seen in some of the outside areas.

WHAT CAME OUT

Out of all this rubbish there came 6800 odd loads of clinker for the roads. But out of the rubbish before it reached the furnaces came some other things. In certain of the world's great cities all sorts of "by-products" are based on the rubbish destructor systems. Paris, for instance, has a small army of "chiffoniers" who sort out the rags, turn all sorts of refuse into money. They are more picturesque and less unsavory in stories than in real life. Incidentally, they hand over large quantities of old rags to be torn up by a mechanical "devil," and sent out here as "real woollen" blankets and garments and clothes, to compete with our good, clean, wholesome local manufactures. "Shoddy" is a great industry, and much of it comes from the dust heap. Christchurch will have no such industry at its destructor, nothing that might disseminate disease. The iron, the lead, and the zinc are sorted out and sold to local foundries. The bottles are also sorted out and sold. The rest goes into the furnaces. Once a great deal of condemned fruit used to go in; sometimes as much as two or three tons of fish and fish offal. Once the Customs Department used to send things that duty was not paid on, like tobacco—everyone has heard of "the King's pipe," but the queerest thing the Customs ever sent was a couple of tons of imported mutton birds. That was some months ago, when the consignors would not be responsible for the duty, and all that good mutton bird went up in flame and smoke. It was not necessary to add coal to that consignment. The destructor staff have no objection to mutton birds, but

they do object to unused cartridges, and would like the fierce rabbit potters of the Port Hills to be less free in dropping their unfired cartridges into the rubbish bin. When the sorters don't spot them they go off, and one day a bullet from one went through the roof. Those I saw had shot, and they are less dangerous, though still not the sort of thing you would care to feed your fire with. Once it was the custom to bring horses to the destructor, assassinate them on the premises, and cremate them while the owners waited. Once somebody's leg arrived, without the rest of the owner. That created more excitement than the arrival of a whole village would at a Macedonian or Armenian destructor.

EXTENDING THE SERVICE.

As I said, the destructor is dealing with its full capacity now in the rubbish that comes in from 7.30 in the morning to 5 in the afternoon and that is being consumed all round the clock, but there is an extension scheme in hand to increase its capacity. An "induced fan" has been installed and gives a better draught, and so more refuse is consumed. Then automatic feeding of the refuse to the furnaces is being tried on a system designed by the department itself. There are already two automatic stokers for coal, as you may see if you look in the Armagh street doors—a Babcock chain grate affair, and a Hodgkinson. With increased draught and automatic feeding of refuse a good deal more can be got through. More steam will mean more electricity to sell, and more electricity to sell means more profit.



THE HISTORIC PROVINCIAL COUNCIL CHAMBERS—A SITE SOUGHT AS A TOWN HALL.

CHAPTER VII.

THE LAKE COLERIDGE SCHEME.

THE GROWTH AHEAD.

What the electrical department is to-day is nothing to what it will be after that fateful day when the Government fulfils its undertaking to turn power generated at Lake Coleridge into the Electrical Supply Branch of the citizens' business. Probably you have heard so much about that from the experts that you know little or nothing as to what it all means, beyond the fact that the shareholders authorised their Board of Directors at the Council Chambers to procure £120,000 to expand the business with.

WHAT IT AMOUNTS TO.

I don't pretend to be able to make the thing any clearer to the average non-expert shareholder than the experts, but what it amounts to is something like this:—The Government having got a grip on some of the water at Lake Coleridge, will run it through a power-house there and transmit the power it extracts from it to a station now being erected at Addington—near Foster's road. It will be brought down by wire. Though there is "wireless" transmission of power, it is not yet commercially available. Tesla, with the sympathetic help of Edison, Marconi, and other electric wizards, expects before long to radiate power just as they now do wireless messages, making the Victoria Falls capable of running all Africa, Niagara all North America, Waikaremoana, all the North Island, and so on. He has even wirelessly transmitted power in a test from New York to West Australia, but for practical purposes we are still in the "wire" stage of power-transmission. The Coleridge current will come in to the Addington Station at a pressure of 66,000 volts (if this were water it would be 66,000 pounds per square inch.) There will be six converters at the station, and they will convert to 11,000 the city's share.

THE CONVERSION PROCESS.

What that really means in the common tongue is that at Addington there will be six boxes, each containing an iron core, round which the wire carrying

the current from the Lake will be coiled. Round the same core will be another wire to carry away the city's share at 11,000 volts pressure. Now, neither of these wires will be connected with each other. They will, in fact, be very carefully insulated from each other, and also in a special bath of oil. Nevertheless, by induction, electrical current from one wire will be transferred into the other. If the incoming wire is wound six times round the core, and the outgoing wire once, then the outgoing wire will deliver current at a pressure only of one-sixth of the incoming current. Thus 66,000 volts pressure will be "transformed" to 11,000. If the outgoing wire were wound round twice, it would get 22,000.

ANOTHER CONVERSION.

When the city's share is thus got on to its delivery wire, the electrical staff of "The Firm" will have to start a fresh process of "conversion." The current received will be "alternating," but the city's present system is "direct," and to utilise the present system it will have to convert its new lot of current to "direct" also. This will be accomplished by rotary machinery at the sub-station at Armagh street. So that when it comes to the city's switch boards it will be in the form in which it can be retailed direct to the users.

HANDLING THE GOODS.

Having taken delivery of the stocks of electricity that your staffs are going to trade off for, and to, you, they have to make ready to parcel it up for the customers. To do this there are two main "sub-stations," one at Armagh street, where the present plant is, for the main "reticulation" of light and "direct" current supply. The greater part of the street lighting will be done from there. The other will be on a bit of your land at the corner of Montreal street and Moorhouse avenue, where the City Surveyor has some of his road plant, and where it was necessary to build. This place is practically in the centre of the industrial and factory district, and its speciality will be supplying power to run machinery.

BRANCH SHOPS.

From those two sub-stations it is proposed to run underground cables at 11,000 volts pressure to various sub-districts where there will be "transformer" houses to reduce that pressure to one suitable for supplying the lamps and motors of customers. These branch retail "shops" are allocated where they are likely to get the most business. Then there is the supply of suburban municipalities. The City Council thinks that because of its greater facilities for "breaking bulk" and "handling" than each local body would possess, and also the saving in cost of supervision, that it will be able to handle their retail trade more economically than they could do by entering into the wholesale business and buying from the Government themselves.

THE HUMAN EQUATION.

The present Electrical Department is supplying about 2000 h.p. light and 2000 h.p. power, distributed to within a radius of about one and a half miles from the station. On the south, for instance, it lights the Presbyterian Church at Sydenham, on the west enters the Gardens and works a motor there for pumping water. On the south-west its business connection touches this end of Lincoln road, on the north-west it goes to the Carlton Mill road and over Bealey avenue. On the east to Edgeware road, St. Albans. A nice little business that has apparently been profitable. Now that it is going to take a plunge on an ever so much bigger scale, what is the human material it has for the expansion?

THE INEVITABLE "SCOT."

First there is Mr J. C. Scott. What is it that has given to the Scot—with one "t"—the world's engineering rooms? Poke your head into an engine-room anywhere to ask the time o' day, and the voice that replies will, in nine cases out of ten, speak the Scotch language. Sometimes it will have a super-added American twang, sometimes an Australian drawl, or even a Turkish guttural. Or it may be the "real thing" pure and undefiled "frae Glasgow," or Otago—with the accent on the "eh." Everywhere you will find a McAndrew tending his clanging, whirling, engines, with as much sympathy and more wisdom than the average mother tends her bairns. The head of the City's Electrical Department is from Otago—via Glasgow. He began his mechanical studies by relieving Milton cows of lacteal pressure before setting off on a two-mile tramp to school. Whether it was the milking, or the process of blowing on his fingers

on frosty mornings, that turned his mind to engineering I don't know, but here are the essential facts of his subsequent doings:—Apprenticed Kincaid, McQueen and Co., engineers; Union Steam Ship Company, Port Chalmers dock, repair work one year, at sea as engineer seven years, Board of Trade certificate as chief; then to Glasgow and West of Scotland Technical College, to study electrical engineering under the well-known expert, Professor Jamieson; seven years in engineering business at Invercargill, including putting machinery into Molyneaux dredges.

A USEFUL EXPERIENCE.

Finally, Mr Scott had four years in charge of the Gore electric lighting scheme, and thence to his present post, six and a half years ago. The Gore experience was of particular value, since on taking charge Mr Scott carried out just the change he will have to carry out here. He converted a direct-current steam-driven light and power system like our present one to a hydro-electric alternating current, such as we are to get from Coleridge. The Gore current is received at a pressure of 5000 volts. The Coleridge will reach us at 11,000. That is the main difference. One thing Mr Scott can also boast of—he once threw light on General Booth. It was on the General's first visit to New Zealand, and he was to be a guest of the Cruickshanks' of the Twine Mills. Mr Scott put in the first electric motor in Southland, and the first electric light, to light the factory and the private residence for the visit.

AN EXPERIENCED ASSISTANT.

Mr Scott has provided himself with a valuable assistant, Mr J. Lythgoe, who will be his right-hand man in the conversions. Mr Lythgoe came here from the Dunedin Corporation, where he was in charge of the reticulation for light and power in the Waipori scheme, but before coming to New Zealand he was in charge of the erection of "Extra High Tension" switchboards, and boards for sub-stations, and plants (including reticulation) for the Dublin City Corporation in a similar scheme to that to be carried out here, and he learnt his business with Ferranti, Ltd., of Hollinwood, Lancashire, one of the world's principal makers of high tension switchboards.

AT THE POWER STATION.

At the present power station and destructor, the Engineer-in-charge is Mr Beveridge, who served his apprenticeship with J. Cran and Co., engineers and shipbuilders, of Leith—

Scotch, ye ken—and had fourteen years at sea with Thompson's and other lines, mostly in the China trade. He, of course, has his chief engineer's ticket, and of his four-shift engineers, three hold first-class certificates and one second. At the power-house there are also three main firemen, fourteen stokers and assistants, and a blacksmith, who does all the smith's work needed for the department.

THE "OUTSIDERS."

For the "outside" work there are three branches. There is Mr Gray, the "meter-man." He tests all meters, installs them, reads them, and makes ready for the accounts which are sent out from the accountant's office in Worcester street, and collected at the little counter in the Town Clerk's office that I told you about earlier. But Mr Gray is more. He is "the man behind," the City Organist. He, in fact, looks after the motor that blows the organ, and without which the City Organist would be playing Dumb Crambo, and Mr Gray is a bit of an organist himself.

Then there is the installation work and testing, which is in the hands of the electrician, Mr Knight. The work

itself is done by contractors, but Mr Knight tests it before the connections are made. He also looks after the public conveniences, where there are the motor pumps which raise the sewage from their sunken sites up from six to nine feet into the main sewers. There are four of these motor pumps, two sets at Cathedral Square and one each at the White Hart and the Exeelsior. Mr Knight looks after all the electrical wiring in the Council's own services. He also bears the heavy responsibility of the time of the City, and has one assistant.

The reticulation is in the hands of Mr Bailey, foreman lineman, with three men as a staff at present, but sometimes twenty, and when Coleridge is going will need a small regiment. He erects the mains and makes all the connections after the installations have been tested by Mr Knight.

In charge of the office in the Theatre Royal Buildings, Gloucester street, is a young lady typist. One of her duties is to look after the very complete "consumers" cabinet record. That has put all the electrical particulars into one card system, instead of being distributed in three or four different boxes, as formerly.

A NOTABLE ELECTRICAL FIRM.

When such a large proportion of the people of Christchurch will be requiring electrical installation in connection with the City's great venture in popularising electrical supply from Lake Coleridge, it is of particular interest to them to know just what clever electricians, like

BROWN BROS., OF 641 COLOMBO STREET

stand for. Mr. A. E. Brown, A. Inst. E.E., and his brother, Mr. P. H. W. Brown, were young men who became so noted for good electrical work that they were urged to start on their own. They did, and they have, with remarkable rapidity, built up a very fine business as electrical engineers and contractors, handling electric power and lighting installations and electrical supplies of all kinds. The many who saw their excellent exhibit at the Christchurch Show, or, better still, those who visit their workshops at 641 Colombo Street, can form a good idea of where the firm stands now. The complete electrical equipment of these shops, and the work they turn out, is a revelation. And it is not merely that the firm is prepared to advise free, and to quote for and undertake at the most reasonable rates installations of any magnitude in connection with Lake Coleridge scheme, but they are prepared to do the work promptly, and to supply at once out of their stocks all that is required. And as they hold the Christchurch selling agencies for The General Electric Coy., of the United States, and the British Thompson-Houston Company, of Rugby, England—two of the largest electrical supply companies in the world, and who have supplied nearly every successful municipal, electrical and tramway concern in Australasia—their exceptional ability to fulfil contracts can be understood, as well as the fact that the firm has a large number of orders for Coleridge equipment already in hand. Brown Bros. design and manufacture Pelton and Water Wheels, Hydraulic Governors, etc., and have on hand several orders, one of the wheels now under construction developing 102 BHP.

Other agencies which Brown Bros. hold are :—

Maloney's wonderful "Vigilant" Fire Alarm, described in the articles on the Fire Service.

A. & P. Stevens of London, Electric Elevator Specialist, contractors to the British and Canadian Governments.

Glover and Co. (London), makers of electric cable, The most up-to-date and attractive display of appliances for electrical cooking, heating and light, may be inspected at their showrooms (opposite Mason, Struthers & Co. Ltd.).

CHAPTER VIII.

THE CITY'S TIME.

THE TOWN CLOCK.

If Christchurch hasn't yet got its Town Hall, it at least has a Town Clock? Have you ever seen the Christchurch Town Clock? Yes, of course you have!

Well, I am not so sure. I never saw it myself till after I had lived six months in Christchurch, and I am not short-sighted. I am inclined to think that very few people of the 83,000 odd in Christchurch have, either. It isn't the clock you see over the Post Office, or the one that turns an impassive face on brave Passive Resister, bloodthirsty Territorial, gentle Red Revolutionary, utterly depraved "Special," and brutal policeman alike, at the Clock Tower. Those are brazen masqueraders, pretending to be free agents, while in reality they are held tight in leash by the real "power behind the face," unable to move even one minute without its sanction. The fact is that the time of Christchurch is held in the remorseless hands of a Trust. All enterprise and independence are crushed out. If the clock in the tower wants ever so much to run fast and speed up things in the city generally, so that the Hour of Hours for some sighing youth and maiden may come round the more quickly; if the Post Office clock desires to exercise the right of Private Judgment and ease up upon the mad rush of time and life—they simply can't do it. They are under Compulsory Training, bond slaves of capital, and have to do what they are told or and have to do what they are told or stop altogether. And the tyrant that rules, the real Town Clock, is hidden, like the wire-puller of a trust, away in a quiet corner of an office. A tall, slender, in-offensive-looking slip of a clock it is, a youthful edition of one of those delightful old "grandfather" clocks, but guilty of an oppression and a tyranny that no self-respecting grandfather's clock could ever have been guilty of.

IN A CORNER.

If you enter the Town Clerk's office you will see the clock standing in a corner, an example of mock humility, as though all it thought of was the need to tell Mr Smith that it was time he paused in the whirl of guiding the Firm's business to take some susten-

ance. Its smug face gives no indication that every watch in Christchurch is hanging on its tick, that the youth and beauty of the city wait upon its movements with bated breath as the hour of the appointment they made by it approaches. It ticks on, callous, indifferent, unperturbed, the very embodiment of sordid materialism, careless alike whether those who obey the every movement of its satellites' hands move to death or rally to life; whether the engagement it hurries them off to is a wedding or a funeral, a meeting of the Prohibition League or a festive gathering at the hotel round the corner or somebody's club. This sordid and callous tyranny, I presume, has been tolerated so long only because it was not known. When I have exposed it, no doubt there will be some organisation and some fitting movement set going to free Christchurch from such ignoble shackles.

THE MASTER CLOCK.

Well, this Town Clock in the corner of the Town Clerk's inner sanctum is what is called a "Master Clock." It shows one face to the Town Clerk, but it shows five others in the headquarters of the Firm, and it shows the others already mentioned in the Post Office tower and the Clock Tower. Every one of the hands on those faces is controlled by the master clock, and moves simultaneously at its bidding every half-minute. Watch them, and you will see that they proceed in half-minute jerks. They can't help it. The clocks in the P.O. and the Clock Tower have their own mechanism, but it is so bound by the Master, that it can only move in those half-minutes, and then wait till it gets leave to move another half-minute onward. Small electric motors control the works, and the hands are automatically released to make the half-minute advance. Then they are tight gripped again till the next half-minute is ticked off in the Town Clerk's room.

A GENERAL STRIKE.

If the Master Clock struck work, all the associated clocks must strike with it, perforce. Not long ago the electrical supply failed in Hereford street, and the Master Clock stopped. It

stopped for half an hour, because it happened to have been that time off its automatic winding time. The electric interruption lasted more than half an hour, but the clock went on till it wanted re-winding, so that it was only stopped for the half-hour. Apart from that untoward accident it never stops, but goes steadily, day and night, kicking the hands of its "synchronised" slaves on in half-minute jumps, and then stopping them dead in their tracks till it is ready to get another minute ahead itself again. The winding is done by electric motors, and is automatic—so long as current continues. And that is the one piece of consolation the irate young man has when he feels natural indignation at the persistent way in which the public clocks will differ from his watch, and show him to be five minutes late at work. He knows that, after all, behind the imperious Master Clock is just—dirt.

"Imperial Cæsar, dead, and turned to clay,

Might stop a hole to keep the rats away."

So the beastly tyranny of the Master Clock, which cost him a reprimand at his office that morning, after all rested on the rubbish that he shot out in the family dust-bin overnight, that, carted to the destructor early, helped to raise steam to set the electric plant going. And the electric motor that wound up the wretched thing with such persistence and provoking accuracy got its "fluid," after all, from his back yard. Of course, you could harness up clocks all over Christchurch to that Master Clock, but with all the clocks telling the same time everywhere life would be robbed of a big share of its adventure, and the catching of trams and trains and keeping of appointments would become so mechanical as to be positively monotonous.



IN VICTORIA SQUARE!

CHAPTER IX.

THE FIRM'S DEPOTS.

IN THE YARDS.

In writing of the City Surveyor's department I mentioned the Yards. There are five of them, homely, familiar places, with a certain quiet activity pervading them during office hours, and they play an important, if humble, part in the economy of the Firm. The Central Yard, which you enter from Manchester or Gloucester street, and which shares the same block with the Destructor, the electric power and light plant, and the Municipal Tepid Baths, is the chief. As it is also typical, it will be sufficient to tell you something about the portion of your business that is done there.

There is, for instance, the stable for the horses which do the pulling and hauling work of the ward. There is accommodation for 31. On the night I was there 39 were "in residence" and four or five "on leave" in the Council paddocks, recuperating after strenuous toil. The working horses are accommodated in loose-boxes, and above their quarters are the lofts for oats, chaff, bran, hay, also straw for bedding obtained through dealers direct from the farms. The drays, water carts, brooms, horse-scrappers, etc., are housed at the yard. There is a store with every kind of article required in the working of the business, and these are tallied in by Mr Greenwood, who is in charge of the yard office, and tallied out as requisitioned, and stock is taken yearly to account for the difference. In fact stock is taken of everything the Firm owns, just as if it wasn't your collective firm, but your own private business, and you were running it on strict lines.

VARIOUS ACTIVITIES.

There is, at the Gloucester street entrance, the weigh bridge over which the coal and other materials are carted and weights checked. There is the blacksmith's shop, where two sturdy smiths work. They do the iron-work for the street culverts, repair drays, mud drums, water carts, tar tanks, and the rest, but they don't now shoe the horses. That is done outside, as it was considered too much for the men to handle. There is a painter's shop, the painter doing all the work for the Firm in the city, or the gardens, or

the parks. Whenever painting is slack in town and there are painters unemployed, the Firm finds work to do, and takes them on. There is an axiom that a man should put on his best clothes when he is hardest up. Evidently we put on our best paint when the painters are hard up. There is a carpenter's shop of brick and iron. It struck me as a rather roomy carpenter's shop, with a fair light through the roof which might still be better; but the carpenter assured me that it was the worst shop in New Zealand, the worst lighted, the coldest in winter, and the hottest in summer, and didn't seem to value my judgment when I said that I had seen a good many worse in every respect named.

THE CHEF.

A good deal of tar macadam metal is prepared at this yard. The tar is boiled here too, but the greater part of that work is done at the South Belt yard. The tar is boiled for six hours and applied to the screened metal hot, and the "chef" at the tar boiler gets an extra sixpence per day, 9s, as against 8s 6d of the ordinary corporation hand. Another feature of the yard is a great heap of "tins," from kerosene and blacking tins to bird cages and delapidated cycle wheels. These are taken out from the mass that comes to the Destructor, and bulk large, but the system of dealing with it is to send the road roller over it—especially to take the wind out of it. Thus flattened out, it is sent out to Shirley to ornament the golfer's landscape.

A MELANCHOLY SPECTACLE.

But the most melancholy spectacle in the yard is not the relics of departed greatness on the tin heap. It is a grim-looking scaffold curiously compounded of two tanks and a suspended iron cage, like unto the canque in which Chinese malefactors are exposed. This is the sacrificial altar for the homeless or unregistered dog. If he is a good-looking dog he is kept a week and sold or otherwise parted with to someone who will pay the registration, and pay for his board at the yard. If he isn't good-looking, he is placed in the cage above the second tank, the plank is

slipped from under, and the cage plunges into the water. A splash, a few bubbles, a lift of the cage arm, and a melancholy corpse is passed on to cremation in the Destructor furnace next door. No dread of burial alive need perturb that dog.

THE OTHER YARDS.

Of the other yards, the Sydenham yard is in Colombo street, and there there are stables for ten horses, and the drays, water carts, and gear for working the ward generally. The same thing applies to the St. Albans yard, where there are seven horse stalls, Linwood six, and Moorhouse avenue. Except this last, each yard has its own artesian water supply, independent of the city service, the wells flowing freely above the surface as part of nature's glorious gift to Christchurch. Each yard also has its office for the ward foreman, and the men employed in the ward are paid there.

THE WORKING PLANT.

Altogether the Firm has over £10,000 worth of working plant in these yards—£10,268, I believe, is the exact valuation placed on it. It includes three steam rollers, one steam waggon, 13 two-horse water carts, 12 "mud drums" (they take the mud scraped from the streets), one lorry, six horse brooms, and five horse-scrapers, 40 carts and drays, and 58 horses. So you see that you have quite a tidy working plant for your street making and cleaning.

About these 58 horses, I was particularly interested, because there is always a romance in a horse, even when he is the unlucky last—and as things go he will soon be "the last of his race"—in city traffic, at anyrate. It is held in many circles that contact with the horse in any form, and especially with buying and selling him—and the people who "back" him, is perilous. The question of who buys and sells the horses for the Firm is therefore of moment. Who is exposed to these demoralising influences? Careful enquiry elicited the existence of an Honourable Sub-Committee of Horse Copers. They not only buy and watch

over all the horses, but all the fodder. The perspicacity shown in the selection of the Horse Copping Committee is therefore Solomonie.

THE HORSE COPERS.

First there is Cr. Otley. He is qualified as a builder to decide on the elevation, the soundness of stage-work, construction and framework, and the "under-pinning," of the beasts submitted. Then there is Cr. Hunter. He is an expert as secretary of the Drivers' Union, and can decide whether the beast will be amenable to Union rules and specifications. Now that the Carriers' and Draymen's Union is developing into an Auto-mobile Association, Cr Hunter will have a useful outlet in the Firm's horses for the Union members' knowledge of the past. Finally, there is the City Surveyor, Mr Dobson, who conducts a topographical survey. Anyway, the combination acquires some very excellent horses, as you can see any day if you watch your teams at work.

AT CHANEYS.

At Chaney's there is another municipal institution of which not much is known in town. It is some nine miles out on the northern line, where the Firm has 900 acres—of which more anon. All the night soil from the city used to be taken out by train to Chaney's. It was taken in sealed pans, and wasn't, I am assured, at all so olfactory as a pig train. At Chaney's there is a splendid supply of water, which was brought up to a platform on the railway siding, and washed everything away to trenches in the sand. The sending of night soil by train to Chaney's has been discontinued, but a night soil contractor takes it by road from Richmond, Linwood, Sydenham and St. Albans to Chaney's still. But as far as the city is concerned the interest in Chaney's lies in the explosives depot. It became necessary to store explosives in a place clear of the city, and so at Chaney's a fireproof brick building, 60ft x 15ft, roofed with iron, and with concrete floor and foundations was built, and a little 10ft x 15ft house for detonators isolated from the other.



CHAPTER X.

THE MEAT SUPPLY.

GUARDING THE SUPPLY.

There is, perhaps, no object more familiar, in this country at any rate, to 99 out of every 100 of the adult population, than the sizzling chop and the appetising steak. The other hundredth is either a vegetarian or a dyspeptic. One can feel sorry for the dyspeptic, and understand the vegetarian, but what do either—or you who I hope are neither—know about the steak and the chop further back than the butcher? Yet the problems of that steak and that chop have been occupying the minds of municipal, hygienic, sanitary, and dietetic authorities, as well as the stock-raisers of the world for many and many a year. And what municipal guardians of Christchurch have been doing to ensure that the citizens' particular chop and steak will reach their kitchens as chop and steak should, I am going to tell you now.

THE KILLING PLACE.

The place that all these efforts are centred in is Sockburn, about $4\frac{1}{2}$ miles out along the Riccarton tram line. That is where the City Abattoirs are. It is the concentration of all the killing for consumption in that establishment that has enabled a closer and more effective supervision to be instituted than was possible when killing was done at a number of places, and the good thing it is evidenced by the fact that killing is now done at it not only for all Christchurch, but for places as far inland as Lincoln, Darfield, and Cass, and right down to the beaches at the pleasant seaside resorts of Sumner and New Brighton. Lyttelton does its own killing.

THE ESSENTIAL BEAST.

The beasts that are killed at the abattoirs are from a very wide area. The main immediate source is the sale-yards at Addington, where the stock of the South Island, and some of the North, comes to be sold every Wednesday, at the biggest sale of its kind in New Zealand. The prices realised there appear in the papers of the whole Dominion every Thursday morning, and affect the prices at sales from the North Cape to Foveaux Strait. To these sales come increasing numbers of cattle from the North Island. Two of the chief Christchurch butchers practi-

cally rely for beef on the North Island, and do their own importing. These beasts, of course, go direct to Sockburn. They are not traded at Addington. This is in accordance with the laws of economic evolution. The South Island was once famous for its beef, as it is now famous for its mutton. Great estates, once noted beef producers, have been broken up into small farms. Lands over which big herds once roamed are now devoted to lamb-raising, or to dairying, or to agriculture. That tendency will increase, especially in the matter of dairying, and it is not to be deplored, for though it lessens the beef available it increases production of other things and the general wealth.

ACROSS THE STRAIT.

Necessarily the cattle have to come down by steamer. Every week one particular ship brings down 32 prime cattle for one Christchurch butcher alone, and there are other ships in the trade. It is only a short trip—a ferry trip—from Wellington to Lyttelton. There isn't time on it for the horrors of the Canadian-Liverpool cattle trade, but still things can happen even in that short space, and many a beast has gone under to a Cook's Straits storm. Thus the South Island, which once "beefed" itself handsomely, now looks for its steak to beasts raised on the bush farms of the North Island, beasts that are doing their share in the settlement of northern lands by "breaking in" the wild country. Canterbury still supplies her own needs in mutton and pork.

A QUESTION OF COLOUR.

There are nearly 600 butchers for whom killing is done at the abattoirs. These purchase at the weekly sales every Wednesday. They put their golden pennies in the auctioneers' slot. The City Firm—your firm—does the rest, and the rest is all very simple, but also very effective, and rather ingenious. You have heard of the gentlemen at Monte Carlo and other famous gambling resorts who work on "numbers" and "colours?" If number so-and-so turns up in conjunction with red, or black, rouge et noir, as the case may be, then they "plunge" with their "investment." The croupier does the rest. In the abattoir system

it is the butcher who has the number and the colour, but he marks a more substantial investment than the gambler on "systems." Each of the butchers who supply Christchurch with chops and steaks via the abattoirs, has a distinctive number and a colour, and by those he is known. Thus when No. 1 buys at the saleyards, that figure is placed by an employee of yours from the abattoir on each cattle beast that particular butcher has acquired. No. 1 butcher has also a colour—say red, or green, or what not, further differentiated by the place it is put on. So No. 1 for cattle corresponds with, say, "green on the rump" for sheep. No. 2, with "red on the head," and so on. When there is an "A.D.," as well, it means that the purchaser of that beast is a contributor to the Butchers' Insurance Fund, so that if it is condemned he gets a draw on that fund as well as on the Government compensation fund. It makes the yards look like the "symbolised" rate-roll at the head office I told you about.

FROM YARD TO KNIFE.

The Sale over the abattoir artists having put on the numbers and the colours for each purchaser, the stock are driven by them to the abattoir paddocks. The Municipal Firm, that is, "you," has 45 acres of freehold and 105 acres of leasehold for paddocking round the place of sacrifice, and on Wednesday night enough stock are taken to keep the killers going on Thursday morning. Two mobs of sheep are usually brought up by the shepherds on the Thursday morning. The "lion in the path" is the Riccarton Borough By-law, which declares that not more than 20 head of cattle may be driven through the Borough in one mob, or 200 sheep—and that they

must only be driven between five o'clock in the afternoon and seven o'clock in the morning. That might be all right in summer, but unless as a torch-light procession, it is obviously impossible to do it in the winter. As it is, to reach the abattoir paddocks by dusk, the beasts have to leave the saleyards by 3.30 p.m.—which is bad for the five o'clock by-law.

When stock cannot be got to the abattoir till Thursday, the day of the big killing for Saturday's trade, it is necessarily killed hot directly it arrives, and stock in that hot condition is anything but good for the ultimate steak, and the fact that there is no cold storage there, as there ought to be, makes killing ahead impracticable.

READY FOR THE SACRIFICE.

When sheep arrive at the paddocks they are divided into three mobs, and the shepherds know exactly what "colours," that is, which butcher's, stock constitute each mob. The cattle are in one herd, and they are drafted to numbers as required. The dogs do the drafting—wonderful dogs. Some of their owners say that they can read the marks on the cattle—know the colour on the sheep, and can "cut them out" as needed. I don't vouch for that myself, but when you see what the dogs can do, as they draft out sheep in the races, running along on their backs, your mind becomes receptive to almost any dog yarn. Each butcher is rung up on each working morning, and his order taken for the number of head of his stock he desires killed. The shepherds and cattlemen note the orders in the order-book, and draft in the number required from the particular numbers and colours, and bring them to the races beside the wall of the abattoir that will presently open to engulf them in the fatal killing pens.



THE CITY FIRM'S HEAD OFFICE—NOW QUITE INADEQUATE TO THE "TURN OVER."

CHAPTER XI.

AT THE ABATTOIRS.

THE KILLING.

I left the doomed stock outside the shut-down portals of the death chamber, waiting, unconsciously, or with such premonition as beasts may have (and the Highland Celt at any rate will tell you that beasts are "fey") the pithing bar or the knife. To the cattle beast it comes alone, or if the beasts are small, in couples. They do not see the fate of comrades who have preceded them in the killing pens. They are slaughtered, too, expeditiously in the pen, with the heavy bar pither from above, and their throats speedily cut. The glazing eyes and gaping throat, emitting its crimson stream, are not "pretty" to look upon, but—the world wants meat, and there are much worse ways than these, much less humane. Still—it was at one time the custom, it may be now for all I know, to prescribe the drinking of bullock's blood hot from the beast's closing veins to sufferers from anæmia, or from consumption. Accordingly, at the great abattoirs of Paris or of Berlin, delicately nurtured women were wont to line up for their draught of blood, and it is said that some of them, many of them, became possessed with a desire to watch the killing that freed their draughts. Possibly. The keenest patrons of the bull ring are of the fair sex. The thumbs that turned down in the gladiatorial games belonged to the fairest patricians of the Roman Empire. Still—I am glad that I am neither anæmic nor consumptive, if the only remedy was the remedy of the abattoirs.

"SHEEP TO THE SLAUGHTER."

If the bullock or the cow cannot see its comrade's sacrifice, it is different with the sheep. The killing pens are filled, and the sheep taken from them as the work progresses. The survivors stand watching their comrades writhe under the knife stroke. It is soon over once that knife falls. There is soon but a huddled heap of blood-stained wool and potential mutton where was but a few moments before life. While these are being taken out, skinned and "dressed," the survivors await their turn, huddled together at the back of the pen, their eyes conveying no expression humanity can read, the embodiment of resignation to fate—kismet! "As a lamb that

is led to the slaughter, as a sheep that before her shearers is dumb," now as ever.

PITHED !

The bullock having been pithed and bled, the head is severed and the carcass hoisted up. Everything is done with mechanical aids to save pulling and hauling. As the carcass hangs it is skinned and disembowelled, a tin tag with the butcher's number is, under the system I told you of, attached to the tail. The dressing and cleaning finished, the carcass, bearing the indicating number, runs along overhead rails to its appointed place, and the hide is left in a little heap on the floor, below where the carcass it enclosed hangs. The tongues, with a blue-pencilled number on them, tripe, and caul fat, all hang together by the carcass, and are run down the rails to the delivery waggons when the time comes to take them to their owners. The hides go to the auctioneers or to By-products, which is an important company formed by the butchers and others for utilising by-products of the slaughter pen, and making the most out of every beast. Everything is examined either by Mr Kyle, G.M.C.V.S., Inspector and Manager of the abattoirs, who acts both for the Government and the city, or Mr Rutherford, Government Meat Inspector, and anything unfit for human consumption is condemned. The carcass is then slashed deeply in the shape of a huge "broad arrow"—and it goes direct to the boiling-down vats. While I was there one Friday three carcasses were thus marked. One of them had been a grand looking beast, one of a fine lot from the North Island, and showed no sign of the tubercle while living. Yet it had tubercle in the "miliary" form—so-called because it permeates a carcass with small tubercles, like millet seed, readily seen the moment it is opened up. It is distinct from the glandular tuberculosis which affects the glands.

A BULLOCK'S DIGESTION.

While all this is happening to the "meaty" portions of the beast, the interior fittings are being operated upon by another set of men. And they bring home the wonderful gift that was be-

stowed on the cattle beast. In the decadence of the Roman Empire, epicures were wont to tickle their throats with a feather, so that they could have the pleasure of eating another dinner after the cataclysm had passed. I once saw an English epicure use the Roman practice. I could never look upon the man after, unmoved. If those epicures had been plain cattle instead of merely polished "hogs," they would have been able to enjoy their dinners twice over without mechanical titillation. Everyone knows that a bullock is a ruminant and "chews the cud," but it does come home to you just how he does it when you see his four stomachs spread out in a row. The first stomach, a paunch, is merely a collecting bag in which he accumulates the grass. At his leisure, he will lie in the sun or the shade—according to the time of the year—and bring those accumulations back into his mouth, there to be well chewed and returned to the second stomach. The third stomach is the most curious of all. It is a complete grinding apparatus with the food tight packed in layers between tissue of which there are so many leaves that it is called "the Bible" by butchers. The walls of the first and second stomachs constitute "tripe," but the contents of the stomach are the only thing that By-products cannot deal with. They are emptied down a concrete shoot and carted on to the land. "The Bible," and the stomach proper, go to By-products. A beast should not be fed for forty-eight hours before it is killed, but it is fully occupied in chewing over its previous dinners in that time. In the offal room the fat is put in bags and sent to By-products, fat merchants, and soap works. And there is a suspicion that some of it becomes "butter substitute," otherwise "margarine." Also the bullocks' blood is carted away to be made into manure.

OUR MUTTON.

The same principles as govern the beef procedure govern the mutton. The shepherds having noted the orders for each butcher in the morning's order book, draft out the required number bearing his colour from their flocks, and bring them to the pens.

At each pen is a slate with the numbers to be killed of each colour, and if those numbers do not come forward correctly the foreman slaughterman at each pen instantly calls to the shepherds to adjust. As the men kill the sheep they "dress" them and take off the pelts, which are wheeled to the skin men by boys, and there sorted out to colour and checked with the numbers ordered. They are sent to By-products, or the tanners or sale-rooms, as the owner orders. There is thus a system of four checks—the order book, shepherds, foremen slaughtermen, skin-men, and the office.

GUARDING THE PUBLIC.

The dressed carcasses hung up, and run along the rails, are inspected before going out. With sheep the process is to feel all the glands. Abscesses are sought, not tuberculosis. In some millions of sheep which Mr Kyle has examined, he has never once found tuberculosis. The most common troubles in mutton are hydatids, glandular affections, and various cysts. Sheep are peculiarly subject to little cysts, old ewes being sometimes full of them. They get into the flank muscles. Then there are hydatid cysts in the kidney fat, differing from the hydatid found in the liver which is common to sheep, dogs, and men, a terrible and too-prevalent affliction. Lambs are singularly healthy. Last year (to 31st March last), out of 18,000 odd lambs, only two had to be condemned, and out of 118,000 odd sheep 313 were condemned. The sheep offal room is another busy place, one of its activities being the turning out of "runners" to make sausage cases. Again the By-products concern figures, including "sausage casings," in its output with its hides, pelts, tallow, blood manures, pigs' hair, etc. The sheeps' heads go to be boiled down too—thousands of them. Sheeps' head is excellent and economical meat and soup-producing material, but there is no demand for it in Christchurch, and butchers rarely have them left on. The poor man's standing order of "sheep's head and pluck" is evidently a thing of the past here, but as there is a demand for brains the brains are taken out for city consumption, and the rest of the head goes to the boiling-down vats.



CHAPTER XII.

STILL AT THE KILLING PLACE.

MANY INTERESTS.

The ramifications of the Municipal business concern in Christchurch are nothing like so extensive as those of many municipalities elsewhere—take Glasgow and Berlin as examples. Still they are so extensive, and touch so many other activities and developments and ideas at so many points, that almost any one of them would provide material for as many chapters as I can devote to all of them. Thus, I had intended finishing with the Abattoirs in one chapter, and here I am inditing a third; and though with pigs I shut down on the place of slaughter, it will be by cutting out material that would have easily filled three more, and still left some interesting points untouched.

THE PIG KILLING.

The killing of pigs is done in a special building separated from the main building in which cattle and sheep are dealt with, by a cartway, beside which are the blood vats, from which carts take the blood, and the pumping plant which puts the washings of the establishment on the 30-acre sewage farm. That farm has not been a success so far. I believe rye was sown last year, but it had to be ploughed up again, and better results are hoped for. The pigs are whipped up on to a rail by electric hoist, bled there, and dropped into a vat of hot water, where they are scalded, and pass on into cold water. This is the American system. The hair is "shaved" off by stalwart "barbers" with three-cornered scrapers, and fetches about £10 a ton for stuffing furniture and various purposes as bristles.

THE ORDEAL BY FIRE.

This is in contrast to the "mild cure" scorching system introduced to New Zealand years ago by the patriarchal Vecht, the handsome and brainy reproduction of the Hebrew prophets of old time, who, while passing the pig as unclean himself, did more than any other visitor to insure that those who ate pork in Australia ate it clean. The Vecht system had been in vogue in Denmark for centuries, and consists in passing the stuck pig through a furnace instead of a hot water vat, when the hair is

burned off, the skin scorched, and the fat sufficiently melted to seal the pores. Mr Vecht succeeded in patenting the process in New Zealand, and big royalties are still drawn from it. It was a shrewd thing, done by a man with a mind far above pork (he had one of the Zangwills as his private secretary, and was a discriminating patron of literature), yet who, as a member of the Intra-Marine Supply Association, supplied many of the navies of Europe with "mess pork." His visit to Australasia was to create new sources of supply from the lean, paddock-raised, and grain-topped-off pigs that the "mess pork" required. The skim-milk-fed pork would be viewed by him with as much horror as he expressed for the "stye" porker.

THE HEALTHIEST PROVINCE.

Canterbury is the healthiest pig centre in New Zealand. When the Government a few years back was strictly enforcing the destruction of tuberculous pigs, some of the North Island factories had to close down, and there was an outcry as to killing the industry. So the grip was made less tight, and an effort was made by the Department to effect a cure by getting dairy factories to introduce pasteurising plants for the skim milk. In one Manawatu district, which was described as "absolutely rotten" with tubercle, the pasteurisation of milk has effected a most marked improvement. Canterbury, as an agricultural district, in which pigs are fed on grain and roots, turns out the healthiest pork in the Dominion, and that is making the Christchurch abattoirs perhaps the most important of the country's killing places. Leading North Island bacon firms are availing themselves of it. For the year 1912-13 there were actually 16,281 pigs killed at our abattoirs, of which 167 were condemned. That would be thought a wondrous good figure in the North Island, yet it is not so good as Canterbury could show before dairying began to spread. For instance, in 1904-5 out of 5636 pigs killed (a figure which shows how the pig-killing here has increased) only 23 were condemned. A mob of pigs from Ellesmere, Tai Tapu, or Kaiapoi speedily send the tally up, but even these are not nearly so bad as the North Island pigs either for tubercle or hydatids.

Some recent lots of North Island pigs received have been hydatid-infected, and a lot received from Kaikoura twelve months ago were "rotten" with that disease.

CONDEMNED BEASTS.

In the year 1912-13, 13,114 cattle were slaughtered, and 313 condemned; 2691 calves slaughtered, 27 condemned; 118,265 sheep slaughtered, 313 condemned; 18,401 lambs, 2 condemned; 16,281 pigs, 167 condemned. A comparison with 1904-5 shows both the percentages and the growth of the business since: Cattle 9049 killed, 89 condemned; calves 2514 killed, 5 condemned; sheep 81,860 killed; 48 condemned; lambs 9668 killed, 1 condemned; pigs 5636 killed, 23 condemned. May is one of the worst months. Apparently farmers send their old cows as the pinch of winter is felt, but the proportion of cows to bullocks is low. In North Island dairy farming districts the beef supply is now mainly "culled cow," and the Christchurch meat supply is the best in New Zealand. As for tubercle, though it is not decreasing, not only is the public protected by having all killing concentrated under inspection in one place, but obviously under such circumstances infected beasts are kept away which, under other circumstances, would have got to the frying pan and the oven instead of the boiling down vat.

WHAT THE INSPECTION SHOWS.

It is not so easy for the abattoir inspectors to trace the district from which cattle come, as that of the pig districts, but their experience is that of North Canterbury the most healthy district is the Peninsular, both for cattle and sheep. Of the North Island cattle that are coming down in increasing numbers, those from Taranaki are the worst, and Hawke's Bay the best from the point of view of tubercle. Southland is less healthy than Canterbury, and the shelter belts planted by the old settlers of Canterbury probably are a considerable factor in the superior health of its stock. Among sheep there are two or three stations which send in crossbreds and come-backs to the merino that appear to be susceptible to glandular troubles. These and parasitic diseases lead to the sheep condemnations. Calves condemned are mainly suffering from tubercle, or are under the 60lb weight minimum. What happens in regard to all these condemned stock is that they go to the boiling down, but they are entered up in a Compensation Book, and on Mr Kyle's certificate the Government pays 1d per lb. for heifers and bullocks not

exceeding eight years old. The same for sheep and lambs. For pigs the compensation is 2d per lb. under 200lbs, and 1d for pigs over 200lbs. For cows not exceeding 10 years old, 2d per lb. is paid, and for calves, which must, however, exceed 60lbs "dressed" weight, the same. As already mentioned, the butchers have also a Mutual Insurance Fund.

THE MANNING OF THE WORKS.

Everything at the abattoirs is under the control of Mr Kyle, who was one of the first graduates of the Melbourne Veterinary College in the Melbourne University, of which Professor Gilruth had charge later. He was in private and general practice at Ballarat, and inspected the first shipment of frozen meat sent to Gibraltar to comply with the Army conditions. Then he was appointed veterinary supervisor of the Invercargill abattoirs, and after six years there was given his present charge, which he has held some seven years. He is also Government Inspector of Meat, and is assisted in this by Mr Rutherford. On the pay-sheet are 40 men. They include an engine-driver, caretaker, 4 labourers as cleaners, 2 head slaughtermen (one of whom looks solely after the pigs, and the other the cattle and sheep), 17 head slaughtermen working under the Slaughtermen's Award, which was claimed to be the most advanced in the world when made. Their pay is £3 10s per week, and with overtime works out often to £4. Eleven assistant slaughtermen work under the Canterbury Slaughtermen's Assistants' Award, their wages being—over 18 £3, 17-18 £1 17s 6d, under 17 £1 10s, and there are three shepherds, assisted by an unspecified number of wonderfully clever dogs. Though water is always flowing and the hose constantly at work, slaughtering is naturally a very messy job. For the comfort of the men a smoking room is provided, where they can eat their dinners or yarn. For their cleanliness baths are provided. They appreciate—and use—the smoking room.

AS A BUSINESS PROPOSITION.

The abattoirs were not built as a business proposition, except in so far as the preservation of the health of the citizens by ensuring them good meat is good business. Yet it seems to have proved not so bad a business proposition either. The total cost was £26,000 odd, of which £24,000 odd is represented by Government loans. These loans will be completely wiped out by sinking funds in 1935-1936, except for £4600 odd in 1941. The working profits have enabled interest and sinking fund to be

paid regularly, and improvements to be made, which in other business would be charged to capital account. The first year, 1903-4, showed a return of £1879 in fees, and an expenditure of £2070, of which £432 was for interest and sinking fund. Five years later the revenue was £2955, and the expenditure £2649 (including interest and sinking fund £817). Last year, 1912-13, the revenue was £9398, working expenses £8778, improvements £573, and interest and sinking fund £975—£10,326. All the time the sinking fund is piling up, and in due course the Municipal shareholders will own the establishment without a "blister."

AN IMPROVEMENT WANTED.

The place was originally run by contractors, who charged the butchers 4s 6d per head for cattle, and 6d for sheep for killing, dressing, and handling. When the Municipal Firm determined to run it itself these charges were reduced to 3s 6d and 5d—a present to the butchers of £1700 a year. It is a pity that instead of that reduction being made, a cold storage department was not added, and the use of it allowed the butchers free. Then killing could have been equalised, rush work obviated, and the stock killed at their coolest. If a fee was charged, the use of the cold storage would be dodged, but if the killing fees were restored to what they were before, and cold storage thrown in, it would be used all right, and the system would work down beneficially for all parties, including the consuming public.

VIOLET AND JESSAMINE.

After a visit to the abattoir it is hard to associate poetry with it, and having inspected the places of killing, and then the office where the clerk-in-

charge keeps a very complete and yet very simple set of special books recording everything with a minimum of labour. My mind was still far from thoughts of violets and triolets, and sweet jessamine and scented daphne. Yet in one step through an adjoining gate to the manager's residence I was introduced to "Jessamine" and "Violet" and "Daphne," fresh from the romantic isle of Guernsey, charming and handsome ladies of high degree, whose pedigree is printed in fat books with pictures of their ancestors. It seems that Mr E. T. Payne, a wealthy Victorian breeder and friend of the manager, sought in the Channel isle itself the best blood he could obtain for money. The parents of Violet and Jessamine were these, and Violet and Jessamine were ushered into being on Australian soil shortly after landing. Violet having won distinction in her first year at Adelaide and Melbourne Shows, the pair came over here, and now have produced Daphne and a small brother. Daphne would adorn a court of Cupids, and Mr Payne makes standing offer of 100 guineas for her. The milk of Jessamine and Violet is so rich in butter-fat that it was considered advisable to step inside and test a tumblerful of it with just sufficient adulterant to remove any chance of microbic infection. The test proved satisfactory, and it also revealed another fact, that the beautiful stock is not all from Guernsey, but that the manager's family includes an exceptionally handsome little boy whose photo, unknown to his parents, won the Pathe picture prize. It is not surprising when you have seen it. With the milk of Jessamine and Violet and the memory of Daphne, it helped to take the crimson blurr from the eyes and the smell of blood from the nostrils.



A TYPICAL CHRISTCHURCH BUILDING—THE SUPREME COURT.

CHAPTER XIII.

KEEPING TAB.

THE ACCOUNTANCY.

Whatever may happen to any other department of the City's business, however they may be able to carry on a semi-independent existence, there is one department to which they must all come in the end. That is the Accountancy. There they are weighed in the balance of figures. On the verdict of those figures some of them will be judged. Like other administrative departments of the City's Business, the Accountancy Branch is most inadequately housed. It is a branch continually referred to, and which requires to continually refer, and it ought to be in the centre of the head office activities. Instead, it is isolated in small rooms in 81 Worcester street. Time in every business means money, and the American "business doctors" would not need cinematograph records to tell where the wastage of the present system lies and how it might be improved upon. Except for its encouragement of the vanishing art of pedestrianism it has nothing to recommend it.

THE STAFF.

The Accountancy Staff consists of Mr Jas Anderson, F.R.A. (accountant), Mr A. M. Owen, F.R.A. (book-keeper), and four assistants. Mr Anderson came from Timaru Borough Council to Linwood, and at the amalgamation came over to the city as accountant, and at that period had the whole of the city's accountancy to do with the exception of rates. Just before Mr Owen joined he worked 300 hours overtime in one year. Mr Owen came from head accountancy of Dunedin D.I.C. and from Strange's (Christchurch) counting-house, where he was chief accountant, and so brought in commercial experience.

One of the most remarkable members of the staff is "The Millionaire." It isn't a flesh and blood capitalist, but an uncanny thing of wheels and cogs and buttons. So far as external appearance goes it is like a musical box. One O. Steiger patented it, and it is made in Switzerland, and for a capital cost of £77 odd, will do more calculations than ever did any lightning calculator or arithmetical marvel. It adds, multiplies, divides, subtracts, works out all sorts of calculations without hesitation from the amount of your rates to the interest on your overdraft to date. With

this sort of Millionaire in the family there is no difficulty whatever in discovering what you owe. The only thing it isn't capable of is what the other sort of millionaire can do—wiping out the indebtedness. The machine works on the decimal system, and demonstrates the simplicity of that system for coinage. Everything in the accountancy office is turned into decimals now, rates and all, on account of the Millionaire.

THE SYSTEM.

The system employed is that receipts are given at the Public Office of the Town Clerk, and the Rate Collectors' office for all moneys received there. The moneys are banked to the city account daily. The receipt blocks are audited by and go to the Rate Check Clerk daily, and the amounts are taken from the receiving department's cash-book and passed through the books to something like 250 departmental accounts. All the expenditure goes through the Accountancy Department. The spending department—say the City Surveyor's—sends its voucher to the Accountant. Another Check-Clerk has to certify to its correctness after comparison with the original order. It is entered up in what is made to serve as a cash-book, but which is primarily a list for submission to the Finance Committee concerned. On the chairman or that committee signing the book, the cheques, signed by two members of the committee and the Town Clerk, as City Treasurer, are issued. When the vouchers come back they are dissected and entered direct from the expenditure ledger in one of its specialised columns, thus checking the committee "cash-book."

"TICKETS" AND "LOOSE LEAVES."

As throughout the Council's business, the "ticket" system is in vogue. Here, it is the "loose-leaf ledger," which is a form of the "ticket" system, as well as the ticket system proper. The various ledgers were designed by the department for its special needs, and with a view to labour saving, and they appear to serve their purpose efficiently. This strikes one right through the Council's business affairs, the way the account-keeping has been adapted to the peculiar requirements of each department. Even with specially-ruled

and summarised books, and every effort to minimise entries, they still involve a considerable book-keeping. Such a minor ledger as the "sanitation ledger," for instance, recording advances for sanitation, shows 1369 such accounts since the start of the system in January, 1909. Between 90 and 100 separate departmental accounts figure in the Council's annual balance-sheet—the bulkiest and most differentiated balance-sheet of any similar body in New Zealand. There were over 18,000 receipts last year in the electric light and power account alone. When Coleridge power comes in, that will mean a further great extension of the book-keeping, which is already casting its shadows before.

"ENQUIRE WITHIN."

The card system proper was introduced to this office first with contractors' deposits, and it has gradually spread, abolishing dead leaves and bulky books, and saving time everywhere. A city accountancy has to be always ready to answer questions and furnish returns, and Councillors may ask for all sorts of information. Some recent queries required particulars of fodder purchased and from whom; of moneys spent on the Waimakariri scheme since 1901; of horses, and dogs, and baths, and dust-bins. All figures come back to the Accountancy Mesh, and the various specialised ledgers enable most of the information to be got together promptly. Yet not all. I wanted to make up a balance-sheet of the abattoirs in ordinary business style. That is, I wanted to be able to show you just how that business has paid. I couldn't, because there is not available a valuation of the plant and premises, in lieu of the taking off of depreciation, and there is nothing showing just how much lies at credit of the sinking funds of those particular loans with the Government Treasury. The information had just been sent for. I can never see why countries and public bodies cannot supply such a balance-sheet as any limited joint stock concern would issue to its shareholders as a matter of course.

SINKING FUNDS.

There is another point that strikes one in looking over these accounts, and that is the loans for which there are no sinking funds, and which must therefore be met or renewed on maturity. Of £457,000 of indebtedness (apart from the Lake Coleridge £120,000 still to come, and for which there will be sinking fund provision), about £100,000 has no sinking fund. The biggest items in these are £35,000 of the original Christchurch municipal loan over Central Ward, £18,500 destructor and sanitary, £23,000 St. Albans, £7430 waterworks (also part of Sydenham schemes, £15,000), £5800 North Linwood, and £2200 Beckenham. Some day these should be dealt with and sinking funds established to put that section of the City's business on a proper footing.

HOW THINGS HAVE GROWN.

It is hardly worth labouring the question of how the business of our City Firm has grown, but the successive "Abstracts of Receipts and Expenditure" issued each year bring it home very strikingly. The first I have under my hand is the "Balance-sheet and Statements, from January 1st to December 31st, 1866, printed at "The Press" Office, Cashel street, 1867." The total receipts were £6827, of which £1200 was received from the Provincial Government on account of a grant of £20,000. General rates collected were £3241, and a drainage rate of £1156. "Scavengering" brought in £578. The expenditure totalled £6074, of which the biggest item was £2331 for drain pipes. Streets absorbed £490. "lighting public lamps" £512, "prevention of fire" £159. "water supply" £50, "scavengering" £623, and salaries £659.

Contrast these with the figures 1912-13, when the total receipts were £387,309, rates representing £124,486, temporary loans £174,774, the abattoirs £9355, and the total expenditure £380,843, a "turnover" of £768,152 against £12,901!



CHAPTER XIV.

THE CITY'S TEPID BATHS.

One institution the people of Christchurch possess which they can safely claim to be the very best of its kind in Australasia, is the Municipal Tepid Baths in Manchester street. Curiously enough, it is not only in the same block as the Destructor of the dirt and rubbish which the people of the city reject, but is actually warmed by the combustion of that rubbish. So that the unclean is utilised to make clean and to add pleasure to the bath of the cleanly. I must confess to being an inveterate lover of water and of swimming, and have swum in many baths and many waters, but though there has been pleasure to me in bathing in enclosed but unroofed sea-water baths in various places, I had never found a roofed-in bath which attracted me till I saw this one of Christchurch. There is something enticing about the whole place from the moment you enter it. It is so clean and bright. The tiles show up the absolute clearness of the water. The glass roof lets in the sun and the daylight, and the hanging ferns give a verdancy and a picturesqueness.

FIVE YEARS AGO.

The baths were constructed five years ago, with a swimming pool 100 x 36 feet. The handsome white tiles with which the whole pool is now lined were not put in for four years. They have completely transformed the baths. The colour lines that run their length add to their appearance as well as enabling swimmers under water to keep straight. The water is got from an artesian well, which sends up a supply of 250 gallons a minute, from 420 feet below Christchurch, beautiful water filtered through 400 feet of shingle. Every night the bath is emptied. Before morning the flowing well fills it up again, taking nine hours in the doing of it. The water flows in direct from the well through perforated piping placed along the rim of the bath, and which has the effect of a cascade. Having come in thus, the water flows out again to where the surface condenser of the Destructor warms it, and then it flows back. In the process it never comes in actual contact with the Destructor steam, and in the flowing back and forth it is thoroughly aerated. It takes the condenser only a little time to warm a bath full, and there is enough steam heat wasted every day to easily warm a dozen baths

of the same size. If the warming process were allowed to go on all day the Tepid Bath would be a good imitation of a boiling lake.

TWO GREAT FEATURES.

When the present custodian took charge the ordinary river water was used, and there were no tiles. The artesian was then being sunk, and it and the tiles and some other things have effected a complete transformation, which is reflected in the fact that the baths are now one of the recognised sights of Christchurch, and spoken of and written about by visitors from all over Australasia and an even wider field. It is reflected, too, in the takings, which have mounted from £500 three years ago to £1300 last year, with every prospect of still larger increase next year. For the rush on these baths is seasonal, though the fact that they are tepid should make it regular throughout the year. The bath at present has 56 dressing boxes, a number totally inadequate. There is, round the gallery, seating accommodation for 600 spectators for galas, and this has to be curtailed in and used as additional dressing accommodation for ladies, and even then there is overflow into the custodian's quarters and the club room.

KEEPING IT CLEAN.

One of the great attractions is the cleanliness maintained. Effort is made to keep out anyone who has any disease that would be objectionable, and the swimming bath is subjected constantly to drastic cleaning. Every night the tiling and the sides are scrubbed with disinfectant and caustic soda; the boxes are washed and sprayed with formalin. The towels and costumes are sterilised by steam from the destructor in a proper steriliser. I have already mentioned the attractions of the ferns. That is a hobby of the custodian, and an admirable one. With tree ferns supplementing his collection of hanging baskets, the city has a Winter Garden as well as a swimming bath. Naturally the moist, tepid air is the sort of thing that the ferns luxuriate in, and a set of revolving sprayers along the length of the bath under the pitch of the roof can not only fill the bath area with a soft and gentle rain, which the ferns delight in, but when the atmosphere in the baths gets stuffy on a

crowded summer day or night, the sprinklers are set to work, and thoroughly purify the air. Of course anyone who has been to the baths knows all about the shoots and climbing ropes and trapezes and Roman rings that are over the water. They are excellent things in reason, but sometimes when some unskilful youth drops from one too near you you are not anxious to see him come up again until the lesson has soaked well in.

USEFUL AFFILIATIONS.

Associated with the baths are the New Zealand Swimming Association, the Royal Life Saving Society, the East Christchurch Swimming Club, the Christchurch Swimming Club, and the Christchurch Ladies' Swimming Club. All these have their headquarters there, and meet in the club room upstairs. Round this room are trophies and photographs full of interest to the members, and to encourage the movement further, special terms are given to members of swimming and life-saving clubs. A prominent feature of the club room is the handsome Wigram shield, representing the Life Saving Championship of New Zealand, now held by Canterbury for two years. Opposite it is the big black and gold banner of the New Zealand Water Polo Championship. From 1891 to 1894, and again in 1896, the Christchurch Club won this when it was a local affair, and having got it outright, presented it to the New Zealand Swimming Association for a New Zealand Championship. Wanganui won it in 1902, Wellington Swifts in 1908, but in every other year it has fallen to Canterbury. Then there is the Duncan shield of the Canterbury Centre of the New Zealand Swimming Association for the club gaining most points in the New Zealand Swimming Championships. It is in memory of the late W. R. Duncan, the inter-club handicapper, who rendered such good service to swimming. So far Opawa—East Christchurch—Opawa are inscribed upon it. There are plenty of team photos upon the walls, but I would like to see here a swimming and athletic library established, and papers and magazines that deal with swimming and life saving filed. It would add to the popularity of the room and make it a more real "club" instead of merely a room for the various clubs to formally meet in.

A VALUABLE SERVICE.

One of the greatest services that the baths have rendered has been in the encouragement of swimming in the schools within reach, as well as in its general effect on the health of that section of the community which avails

itself of it. There are school and local baths all round Christchurch, but this is the chief and centre, and the only tepid bath. It is "the daddy of them all," and the fact that the custodian is an enthusiast helps to make it so. Schools attend in squads of from 25 to 100 for swimming and life saving lessons, and it is estimated that the present and late custodian in the past five years have taught over 1000 persons to swim in it, and at least another thousand have been taught in it by others. Last year 100,000 baths were enjoyed in the swimming pool, and there were 370 season tickets issued.

ONE OF THE EFFECTS.

There has been no serious accident at the baths, and there is hardly likely to be now. Not only is the custodian an expert life-saver, but each of the half-dozen of his staff have been through a course, and know just what to do, and as something like 400 persons have learned life-saving at the baths since Mr Billson went there three years ago, it would be difficult now to find any of the rush times at which there were not expert life-savers bathing. There was an instance of that one night not long ago. A girl got into difficulties, and three other girls actually raced to save her. Each was an expert. The point is that a little before those three girls would have stood helpless on the bath edge and screamed. The family bathing idea on Saturday nights has proved such a huge success that it is difficult to know what is going to be done about it. The baths at present simply cannot accommodate the numbers who want to go to them. The solution, of course, is another bath alongside the present one. The land is there, the destructor steam is there to waste, the supervision is there. It would be a business proposition, and it would meet the greatest good of the greatest number from its central position. To put it elsewhere would not be a business proposition, and would not reach so many. Another suggestion is a Turkish bath department. Again, there is the steam available without further cost, and the site and supervision.

WELL MANAGED.

The Firm is particularly fortunate in having an expert and an enthusiast to manage its baths branch. Mr and Mrs Billson are the joint custodians, and they do their work, not merely with efficiency, but also with zeal. Mr Billson is a Leicestershire man, who learned his swimming from the then world champion, J. A. Jarvis, and became life-saving instructor to the

London police. He took part in many important swimming championship events before he came to Christchurch, and was eighteen months in the local police. The pictures and certificates in the vestibule of the baths include the Diploma of the Royal Life-saving Society, signed by Lord Desborough and Mr William Henry, the highest award that can be given—there are only some seventy or eighty of them in the world. And Mr Billson has given active advocacy and practical help to every life-saving and swimming movement here.

THE FINANCES.

What of the business side? Well, a place of this kind isn't judged from the business side, and very few such in the world pay directly. This one has private bath-rooms with hot, cold and shower baths available to all people at all times, as well as the swimming baths that are restricted by sex divisions at various times. I have made an analysis from the City accounts, but to complete it a valuation of the building and plant would be needed. Debentures for £5000 were issued, redeemable July 1st, 1932, on which 4½ per cent. interest and sinking fund is paid. On the date named they will be cleared off. That £5000 represents the cost of construction, of which £3798 figures in the accounts for 1907-8, and £1201 in 1908-9, but in the yearly accounts charged against maintenance are items that should really be against capital account. These would at least include—Improvements to baths 1910-1911 £322, tiles 1911-12 £326, and tiling 1912-13 £179. That would bring the capital account, if it were a private concern, to £5827, of which provision is made to wipe out £5000. The

revenue and maintenance accounts would then read:—

WORKING ACCOUNT.

Expenditure—Dr.		£
1908-9—Maintenance	...	451
	Interest and sinking fund	310
1909-10—Maintenance	...	415
	Interest and sinking fund	237
1910-11—Maintenance	...	817
	Interest and sinking fund	237
1911-12—Maintenance	...	836
	Interest and sinking fund	237
1912-13—Maintenance	...	1053
	Interest on overdraft	34
	Interest and sinking fund	237

£4864

REVENUE—Cr.

		£
1908-9	...	809
1909-10	...	562
1910-11	...	884
1911-12	...	1038
1912-13	...	1324

£4617

Dr. 247

That shows a deficit of £247 on the working expenses for five years, after paying interest and sinking fund. There is then an indebtedness of £5827 on the capital account, against which £133 of Sinking Fund had accrued on March 31st last, and against which should go the value of the buildings and plant as they stand. It has to be remembered that the baths account apparently credits the destructor account with its heating, and that is included in maintenance. Two years in which the item appears in the abstracts it figures at £189 in 1910-11 and £79 in 1911-12. It is under the general head of "maintenance" in the other years.



A GALA NIGHT AT THE BATHS.

CHAPTER XV.

MAYOR AND COUNCILLORS.

THE BOARD OF DIRECTORS.

So far, I had been conducting this little expedition into the familiar "unknown" places of the citizens' municipal business without entering the Board Room, to wit, the City Council Chamber. I purposely set out to see every thing the ordinary shareholder in the business should know, and give some little idea of the working of each branch through the eyes of "The Man in the Street," rather than through the eyes of the Super-man at the Council Board, who might possibly see it through his own special municipal spectacles. But wherever in the course of my ramblings I happened to meet the Mayor or a Councillor accidentally they were keenly interested in the bringing out to the light of everyday knowledge just what goes on every day in the way of the working of the interests they were elected to control. So now it is their turn.

TWO POINTS OF VIEW.

Citizens in their private businesses elect to the directorate of concerns they have sunk their capital in, those men whom they think best suited to carry on those businesses with the greatest satisfaction and profit. If a director is a sound business man, the shareholder does not bother about his other views or alimentary peculiarities. He does not ask whether he is territorial or anti-militarist, tea debauchee or a taker of other things "for his stomach's sake," vegetarian or beef-eater, Rational Humanist or Calithumpian. He only asks whether he is a shrewd and capable and experienced man to handle his particular sort of business. With City Councillors and like "public" directors, it is somewhat different. They may be elected because of the things they ate and drank, or didn't eat and drink, or the opinions they hold on the inhabitants of Mars or their theories regarding a future state, or the state of Invercargill, or on the colour of their ties. A thousand and one things, in fact, that may have little bearing upon the way to run the business affairs of the citizens' business. It is an illogical attitude when you come to think of it, but it seems to be a part of human nature to readily experiment with what the individual, too often, mistakenly regards as "The Other Fellow's" affairs in a way he

would not with his own. And so, considering that councillors are sometimes elected for all sorts of incongruous reasons, it is gratifying that they make as good a Board of Directors as they do.

THE CHAIRMAN.

The most important member of a directorate is the chairman, or managing director. The Mayor is a little of both. His duties are—well it would probably take much less space to define what they are not. I believe he is not expected, personally, to light the lamps or sweep the street crossings, or even coach the chef at the tar-boiler—not every day, at any rate. There was once a member of the New Zealand Parliament who used to light the lamps of his constituency, and there was once a Mayor of a New Zealand town who objected to the driver of Cobb's coach—great men, I am told, in those days—"showing off" by snapping the light posts his Worship had had put up to protect the street corner from just such "flash" drivers. When the last went the Mayor put in a totara post himself in the dead of night, well stayed, with the result that the coach wheel and coach parted company next day, leaving the sturdy totara still standing. Mayors don't do quite those things now, but they do anything else.

THE MAYOR'S "SPARE TIME."

Take our own Mayor (Mr Holland) for instance—a fine figure of a Mayor at that. Every day he is to be found at the Mayor's rooms at noon, transacting public business of every conceivable kind. Nearly all inward correspondence passes through his hands—most urgent matters have sometimes to be dealt with at once before being sent on further. Less urgent are sent on to the several committees to deal with or report on in due course. He presides over all meetings of the Council, and is a member of all committees. It is in the committees that the real work of the City Council is done, and if the Mayor wishes to get a full grasp of the work of the Council he must attend as many of these as possible, which naturally takes up a lot of time. Last year Mr Holland opened twenty bazaars. As Mayor he is expected to attend all public, and semi-public meetings, and with a committee of ladies

and gentlemen administer the Mayor's Coal and Blanket Fund—other public activities included chairman "Scott Memorial Fund," H.M.S. New Zealand entertainment committee, chairman McLean Institute. He represents the City Council on the Christchurch Fire Board, the Domain Board, and Beautifying Association. Then there are the daily callers whose requests are legion, faulty drains, overhanging hedges and trees, condemned buildings and sports grounds have to be visited. Alleged bad roads and footpaths, and street lighting have to be attended to. Visitors have to be entertained in various ways (lunched by the Overseas' Club, his Worship presiding, being one of them), factories and work rooms inspected, restaurants and dining places visited, and a thousand and one other matters attended to, which all go to fill up what is euphemistically termed the Mayor's "spare time."

THROUGH HIS PAGES.

And what sort of training might a Mayor have for all this—in loco parentis so to speak to any old thing, and every new thing, in the town? The present Mayor's municipal record has been brief, but triumphant. After being on the Greendale School Committee from 1885 to 1899, and the West Christchurch School Committee since he came to Christchurch after that, he made one unsuccessful attempt to get into the Council for the Central Ward, got in at next attempt with a vote of 2539, resigned to contest the Mayoralty the next year, and led his nearest opponent by 1196, and was re-elected the last time with 227 votes over his two opponents combined, and 3754 over the next candidate. And there you are—so far.

WHAT HE THINKS ABOUT IT.

As to the Mayor's views about things, he naturally looks on the carrying of the £120,000 Lake Coleridge scheme loan by 6 to 1 as the biggest business enterprise in his period, and looks confidently to justifying it. Then there is the continuing process of converting streets to tar macadam. As to future municipal policy, he thinks that some

of the most urgent necessities are a Town Hall, and additional office accommodation; establishment of cool storage and municipal markets; and an additional reservoir in connection with the high pressure water supply. The demand for water has greatly exceeded all expectations and estimates. A demand for two million gallons a day (in summer) from a system intended originally to supply half that quantity has been met by the installation of more machinery at the Cashmere pumping station, which I also told you about. As for his experience of the City Council, it is, he says, that it approaches its duties in wholehearted, disinterested fashion, and in many instances, Councillors devote the same time, attention, and energy to the Council's work as to their own private business.

THE COMMITTEE CHAIRMEN.

Next to the Mayor in the administrative scheme of the Council come the Chairmen of Committees. As the Mayor put it, "the real work" of the Council is done in these Committees, just as it is in the Parliamentary Committees. That is distinguishing "real work" from fireworks. They chew up what has to come before the Council, and pass it on in a more or less digested state—a considerably concentrated state at any rate. There is the Abattoir and Reserves Committee, with Cr. Dent as chairman; the Bands and Organ (Cr. Williams); Baths (Cr. Acland); By-laws, Finance, and Departmental (Cr. Sorensen); Electrical Lighting and Power (Cr. Taylor); Water Supply (Cr. Cooper); Works, Sanitary, Gas Lighting, and Quarry (Cr. Otley). Those are the "standing committees," but there is also a special one just now, a sub-committee dealing with the Town Hall question, of which Cr. McCullough is chairman. Councillors should all acquaint themselves with the general work of the municipal business, but these men have to specialise as well, and to be a good chairman you have to fully grasp each subject that you have to handle in committee. So of the Citizens' Board of Directors, first place will be given to the Chairmen, and the rest will follow.



CHAPTER XVI.

SOME OF THE CHAIRMEN.

BATHS.

First, there is Cr. H. D. Acland, well-known as member of a local legal firm, and in local political and other organisations. He is well placed at the head of the Baths Committee, for he is an enthusiast regarding the baths, and a regular morning attendant, and when abroad during 1913 studied baths, scientific dairying, industrial co-operation, and other matters in which he takes intelligent and discriminating interest right round the world. Here is his creed as to the immediate requirements and governing principles of the municipal business reduced to tabloid form:—

“The most pressing work, outside of ordinary work, is to see that the electrical scheme is carried out so efficiently and economically that the citizens get full value for their money.

“In municipal trading the two main things are (1) What does the City give to the citizens? and (2) What does it cost the citizens?

“All municipal undertakings should be paid for by those persons who use them. It is not right that the whole body of the citizens should pay for any loss that might be incurred in supplying gas or electricity to those who want them. Why should I contribute out of my rate-money to enable you to get gas under cost price.

“But if municipal gas or electricity make a profit, the price ought to be reduced to the consumers, as I fail to see why the general body of citizens should have their rates relieved at the expense of the consumers of gas, or water, or electricity, or the users of trams. And vice versa.

“There should be a very stringent depreciation and reserve fund against all municipal trading affairs, and that it is just as necessary for a city to run any public utilities in a businesslike manner as it is for a private company.

“It is necessary to build a town hall at an early date, and increase the accommodation for the municipal officers, which at the present time is very bad.

“The Council should take steps to provide insulated waggons for bringing meat from the abattoirs into Christchurch to a central cooling chamber, where all perishable foods could be stored.

A VETERAN.

Cr. W. H. Cooper, who presides over the Water Supply Committee, is also

senior councillor. He has been a City Councillor over twenty years, Mayor twice, Deputy-Mayor five times, chairman of the Municipal Conference Executive, is on the Hospital and Charitable Aid Board, the Domain Board, the Technical College Board (chairman of its Building Committee), and the Christchurch Fire Board. He served on the old Samaritan Home Board and South Waimakariri River Board. As Mayor, he actively promoted the Diamond Jubilee fund for building the new wing at the Jubilee Home, Woolston. He also carried out the Clock Tower proposal, but his most important work was securing the adoption of a high-pressure water supply system. So Cr. Cooper's experience is “some,” and he considers that local wants have been well attended to in the past. In Christchurch 90 per cent. of municipal income is from rates. Other New Zealand cities enjoy big endowment revenues. Even so handicapped, he considers Christchurch as much up to date as any other New Zealand city. “We have,” he says, “high-pressure water, tepid baths, a splendid drainage system, a destructor, abattoirs, a first-class tram service, and will soon have an unrivalled electrical supply. We have 143 miles of roads and footpaths to keep in order, and they are equal to those of any other city in the Dominion.

“As for future policy, extension of the city boundaries should not be proceeded with without caution. An outside area should be fairly well up to date before it is taken in. There should be a Town Hall, and the best site is that I mentioned at a Council meeting three years ago—along Cambridge terrace between Victoria and Colombo streets. The Godley statue should be removed to a position in front of it. I don't think we should adopt any big road improvement scheme, such as Mr T. E. Taylor's, but I am a firm believer in tar-macadam; we should lay down so many miles each year out of revenue.”

BEAUTY—AND THE BEASTS.

Of the 1913 Councillors, Cr. T. Dent was placed at the head of the abattoirs and reserves. Why the beautifying of the City should be considered the appropriate care of the man concerned about the killing of beasts, and handling of blood and offal I can't guess. In Cr. Dent's case,

however, as a retired farmer, he might be expected to know something about trees and cultivation, as well as about the expeditious sticking of pigs, and slitting of sheep's throats. Cr. Dent was farming down Ashburton way, and while actively engaged, had little opportunity for public life, beyond such as school committees and coal mining and other companies afforded. Directly he had opportunity of municipal service he entered into it *con amore*. With regard to the abattoirs, he is strongly for the introduction of cold storage, both in the City and at the works. It would not only help the working of the abattoirs very much and serve the public in the matter of getting its meat in the best condition, as I pointed out, but there are all sorts of other perishable food products that would be advantaged, and the Citizens' Firm, in taking the matter up, would not be opposing any private interests, since there are none such at present existing. At the works, the only expense would be the freezing engines and the insulated chamber. The staff and supervision are already there. They would enable killing to be equalised, and get over the difficulties of 95 butchers each wanting one or two beasts from their herds at the same time. They would simply draw on their carcasses in cold store. Cr. Dent's

view, however, is that the town cold storage depot should be made first, at a site in some such streets as Tuam or St. Asaph, handy to the centre, and the trainline, or where a siding could be run in from the trainline, and the meat brought to it as killed (when not required for immediate delivery) in special meat cars on the tram rails, and issued as the butchers need them, but all sorts of other perishables, both for export and local consumption, could be stored there till needed, from eggs, fish, game and poultry, to fruit and plum puddings.

On the matter of reserves, too, Cr. Dent has some interesting views which his committee advises. The 1136 odd acres at Chaney's, and 818 at Bottle Lake, as well as the 515 at New Brighton—nearly 2500 acres—appeal to him for their possibilities when planted as timber reserves. In his view and that of the committee, a start should be made by establishing a nursery at Bottle Lake, where trees planted by Mr Wilkins, the head gardener of the reserves, have done well, and planting, say, 50 acres in trees every year, trees suitable for timber and firewood, that would be a very valuable asset to the Firm in the days to come, and practically form another sinking fund, besides, with tracks and roads through the forest, becoming a popular Christchurch walk and drive of the future.



THE PEACOCK FOUNTAIN—BOTANICAL GARDENS.

CHAPTER XVII.

STILL MORE CHAIRMEN.

Continuing the alphabetical parade of those useful entities, the Chairmen of City Council Committees, we come to Cr. James McCullough, Chairman of the sub-committee which has in hand the important matter of considering the Town Hall question. Cr. McCullough has been two years a representative of Sydenham Ward, seven on the West Christchurch District High School Committee, which he also represents on the School Committee Association, of which he is president, and representative on the Technical College Board.

In municipal politics he is a Social-Democratic "whole-hogger," and, he tells me, "stands for the party's platform in its entirety." As this includes a minimum wage of 10s per diem for all municipal employees, and it is suggested that no private employer would give 10s per diem for some of the work involved, such as the sweeping of streets and gutters, that does not appear to require either overwhelming intellectual or physical qualifications, or supreme exertion and brain-fag. Cr. McCullough explains that "the man employed sweeping the gutters, who is socially looked down upon, is entitled to be recompensed for the social ostracism that his occupation involves, seeing that his services are just as necessary for the general well-being as those of the highest official in the Council's employ."

Cr. McCullough considers the present method of doing streets by "patchwork" ridiculous, and favours a systematic plan on some such lines as those proposed by Mr T. E. Taylor or Mr J. J. Dougall. Further, he would have the keeping in order of those portions of the streets controlled by the Tramway Board also in the Council's hands, the Board being charged with the work done. At present the Board has it in hand, and voluntarily co-operates with the Council. Then he would prohibit traction engines in the centre of the City, except for street-repairing purposes. He also thinks that the Council should keep an eye, in likely suburbs that may some day be incorporated in the City, for areas suitable for recreation purposes, and that much more could be done to make the river banks look attractive by laying out suitable points with shrubs and flowers, and the removal of ugly wooden fences.

WORKS.

Cr. H. J. Otley is Chairman of the

Works Committee, the "big" committee which draws into its net so large a share of the activities of a municipal concern. He was municipally "blooded" on the Linwood Borough Council; joined the City Council after amalgamation, was chairman of Finance Committee during his first two years, and after that was "Chairman of Works" till defeated in 1911. He came in again in 1912, was acting-chairman during the while the late Cr. T. Gapes was ill, and elected chairman again this year. He has been on the Drainage Board for about ten years, the chairman of its Works Committee, and acting-chairman of the Board, and he had done good service on the Hospital Board. He himself was a building contractor, but now is a timber merchant. And here is what he says of it all:—

"The Council has vastly improved the streets since the amalgamation. Then the streets in the outside boroughs were not half metalled; often they were only shingled. The Council has, as far as possible, sheathed streets, and built streets, especially in the centre of the town, where they previously had no better foundation than mud. Tar-macadam is making good roads at considerably less cost, for ordinary traffic, than any other description of good roads adopted elsewhere. This tar-macadam system is entirely the work of our engineer, Mr Dobson. The complete high-pressure water supply scheme is supplying artesian water much purer than the Waimakariri water it was at first proposed to bring in. Future policy should be the extension of the city, but on very careful lines. I don't favour greatly extending into districts that are not populated, and involving the rate-payers generally in large expense to get those districts into proper order. Lake Coleridge electrical supply we will have to push for all it is worth, entirely on commercial lines, and I quite agree with 'The Watchman' that the whole of the Council's business should be run in the same way as a board of directors would run a limited liability company, paying the same wages and getting the same return. It is quite time that Christchurch had a Town Hall. Adequate office accommodation is imperative, and I think there is only one place to put the Town Hall—on the Victoria square reserve where the band rotunda is. It is quite unnecessary to consider the purchase of more expensive land when we have the best site possible ourselves."

CHAPTER XVIII.

THE REST OF THE CHAIRMEN.

A MAN OF MUCH SERVICE.

The Chairman of the By-laws and Finance Committee, Cr. H. B. Sorensen, is one of the few on the present Council who has put in long public service. He began with the Richmond School Committee (16 years), continued through the Samaritan Home Board (12 years, chairman for several), City Council (since 1895, and Chairman of Sanitary Committee when destructor and abattoirs were built), Technical Education Conference and first Board of Managers, finally Board of Governors; Hospital and Charitable Aid Board (chairman of Institutions Committee). Further, he has been Deputy-Mayor for the past two years, is a J.P., and is Consul for Denmark and acting-Vice-Consul for Norway. So that he has had a many-sided experience from the fullness of which he says, contrasting present and past:—

“When I joined the Council we had neither abattoirs, destructor, electric works, nor anything of that sort. The destructor was the first thing we took in hand. Mr C. D. Morris, then Chairman of the Committee, and myself, worked hard, and got the Mel-drum plant installed. A certain amount of electricity was then generated, but that department has been added to considerably since. We thoroughly inspected the old slaughter houses, and exposed insanitary conditions, and eventually got the abattoirs.

STILL TO DO.

“We endeavoured,” continued Cr. Sorensen, “to institute a system of milk inspection. The Government stepped in and undertook the duty, but the milk supply question still urgently calls to be taken in hand.

“Future road improvement work must be based on the tar-macadam system, and should be carried out as fast as material can be obtained. I should like to see the centre of the city paved with Nenchatel asphalt, but we can't afford it.

“The electrical scheme is, of course, our biggest work, and the Council is striving to be ready by the time the Government is ready to turn on the current. Cheap power will give a big impetus to the manufactures.

“It is an absolute disgrace that we

have not had a Town Hall before. I feel quite ashamed when away from Christchurch and see what other places have done.

THE ELECTRICAL HIVE.

The Electrical Committee is a hive of activity just now, and though Cr. A. S. Taylor's experience has only extended over two Councils, he is likely to get plenty of it as chairman before the big scheme is swung into action, and is taking a keen interest in the work. Outside it he is a barrister, entitled to put B.A. and LL.M. after his name, and he takes a philosophic interest in municipal government, upon which some of his views are thus expressed:—

“Progressiveness is the outstanding feature of municipal politics in New Zealand generally, and in our own city in particular at present. New Zealand has been so busy hitherto with general politics that we have lagged as far behind the leading countries of Europe in municipal matters as they have lagged behind us in national legislation. The tendency has been for us to rely too much upon Parliament and too little upon our civic powers, but it is now being recognised that it is possible for a wise municipality to do as much, if not more, than the Legislature to provide for the growing requirements of modern city life.

“This progressive spirit was very clearly manifest in the recently elected City Council, but the very existence of this laudable desire for reforms and innovations may prove a stumbling-block. No sensible man would believe that all the planks of the various platforms put forward at the recent election are capable of being executed during the term of one Council, and the Council should concentrate its energies on carrying through a few matters of outstanding importance.

“The installation of Lake Coleridge power is the first and most important work, so that we may be ready in May next. Not only must we give citizens the best and most up-to-date installation in New Zealand, but we must provide for its future management and development on sound business lines.

“The erection of a Town Hall has long been urgent. The citizens should loyally co-operate in erecting a building in keeping with the size and dignity of Christchurch, present and future.

"The Council should push on with the Greater Christchurch scheme, and endeavour to induce the surrounding districts to agree to legislation next year giving the people an opportunity of expressing their opinions upon the question of amalgamation. With our many natural advantages there is no reason why Christchurch should not be noted as the most progressive city in the Dominion."

SWEET MUSIC.

Finally there is the Bands and Organ Committee, of which Cr. A. Williams, a commercial member of the Council, is in control. Cr. Williams has been a Councillor for six years, and he opines that though he has seen many important works completed yet there remains much to be done to make this city more beautiful and more healthy to live in. One of the most important is the better condition of the streets, the busiest receiving first consideration. "I do not advocate wood paving or Neuchatel. The heavy tarred macadam is the most suitable for present requirements. In years to come the more expensive method could be adopted in some streets. One means of allaying the dust nuisance would be having all city streets where there is much traffic swept during the night or the very early hours of the morning, after which the water carts could be used so that by the time business people began to move about the city it would be clean. Another means of improvement would be to collect all refuse, in the inner

area at least, during the night or early morning. This would do away with the objectionable sights and disgusting nuisance of the garbage of the city being hauled through the streets during business hours.

"With regard to butchers' shops, there should be a by-law compelling retailers to make their establishments dust proof, so that citizens might have their meat free from filth and dust. The Council should institute insulated waggons for delivering meat to a central depot. This will receive the attention of the committee very soon.

"I also favour the erection of new bridges over the Avon at Cashel street and Manchester street.

"With the high pressure water supply being completed, and the hydro-electric scheme under way, we should devote time and attention to the streets and footpaths. Having seen that our city is kept clean, then pay a little attention to beautifying and making Christchurch the most beautiful city in the Dominion.

"There has been much talk about the Town Hall problem, and the Council has selected the site now occupied by the band rotunda in Victoria square. It is now most essential that a building worthy of the city should be erected. We have every facility to build one of the finest Town Halls in the Dominion, and could be so designed for revenue-producing that, instead of being the white elephant some people would have us believe, it could be made a very payable proposition."



THE BANK CORNER.

CHAPTER XIX.

THE REST OF THE BOARD.

So far I have interpolated into these sketches of the municipal business concern the views of the managing director and the departmental directors—otherwise, the Mayor and Chairmen of Council committees—upon the conduct and expansion of the business. That accounts for nine lights of the Council. There remain five members of the Board to be accounted for.

THE SOCIAL DEMOCRATS.

Four of these may be grouped under the head of "The Social-Democrats." They are in the Sydenham quartet—Crs. Burgoyne, Hunter, McCullough, and Miller, and Cr. McCombs, of Linwood, and their "platform" is:—

(1) Lake Coleridge scheme to be given fullest effect, by provision of all electrical appliances in connection with installations by the Council, for purchase by consumers at lowest possible cost.

(2) The late T. E. Taylor's road scheme.

(3) Opening of municipal quarry immediately.

(4) Securing a site for a Town Hall.

(5) All work, where practicable, to be carried out by day labour, wages for labourers to be not less than 1s 3d per hour.

(6) Municipal markets and cool storage in the City.

(7) Unification of all civic bodies, and definition of metropolitan area.

(8) Proportional representation—single transferable vote.

(9) Municipal milk supply.

No. 5 is the only plank upon which they are not all agreed. Cr. McCullough's views I have already given as a chairman of the Town Hall Site Sub-Committee. Here are the others:—

CR. BURGOWNE.

Cr. Burgoyne worked his way in Labour circles through the Painters' Union to the presidency of the Trades and Labour Council. As one of the Labour ticket he was elected two years ago for Sydenham Ward. That represents his service on public bodies to date. Since then he has represented the City Council on the Fire Board and the Technical College Board. As to specific questions, he sums himself up thus:—Town Hall: Can't say whether necessary or otherwise, but

undoubtedly great necessity for double or treble present accommodation for municipal officers and offices. Lake Coleridge scheme is the most important and beneficial work undertaken by Christchurch since it was a city. As all present Councillors were elected practically on progressive tickets, all that can be achieved will be, it depends on ratepayers whether or not the Council is supplied with the necessary funds, for it is impossible to do a great deal out of ordinary revenue, and only by loan can anything great be done.

CR. HUNTER.

Cr. Hiram Hunter has had a considerable amount of experience of Labour organisation, has been secretary of the Canterbury Drivers' Union for some years, and an influential officer of the Trades and Labour Council. He took a prominent part in organising the Drivers' Federation of New Zealand and conducted its case before the Arbitration Court for the first Dominion award for drivers. In public service he has been a member of the Sydenham School Committee. He was elected to the City Council in April, 1911, after one defeat, and has this year been re-elected for the Sydenham Ward for a second term. He contested the Christchurch East seat for Parliament at the last general election, and was beaten for entry into the second ballot by Mr T. H. Davey, M.P., by only four votes.

He regards the establishment of a municipal milk supply, cool storage, markets, and improved facilities for the cartage of meat from the abattoirs to a cool store in the city over the tramway system, as the most urgent matters to be dealt with, but legislation is necessary before effective work can be done in this direction, and a Bill to give the city the necessary power to do what is required was prepared by the City Solicitor upon Cr. Hunter's motion.

Demands are being made upon the Council for a Town Hall, road scheme, municipal quarry, tar-distilling plant, another tepid bath, library extensions, widening of narrow arterial roads, etc.; and if all these demands are to be given effect to a quarter of a million loan, at the very least, would have to be floated. He believes these proposals should be placed before the ratepayers, enabling them to vote for any or all of them.

The Councillor would have unification

of all public bodies, at present controlling the area coming within the scope of the Tramway and Drainage Boards, including Sumner, New Brighton, Styx, Sockburn, Cashmere Hills (residential portion), and probably Lyttelton, the residents in the whole district thus defined to elect one governing body, such a scheme being calculated to prevent any overlapping.

The present constitution of the City Council, he thinks, might be bettered, favouring the American system of municipal government by commissioners, as it does not matter how keen an interest a councillor takes in the city's business, nor how willing he is to study it, he is unable to give it all the time needed. The only remedy would be, he considers, to have paid experts, and he suggests four commissioners—(1) in charge of the works department, (2) in charge of inspection of city, cool store and markets—everything pertaining to public health, (3) in charge of electrical department, and (4) in charge of reserves and miscellaneous matters; Mayor at head, and commissioners to be in addition to the City Councillors.

Cr. Hunter is strongly in favour of the abolition of the wards, "provided the election of councillors is carried out under the system of proportional representation."

CR. W. MILLAR.

Cr. Millar graduated through the old Sydenham Borough Council. He signed the original requisition that the district might be made a borough. He was a member of the Sydenham Council when it merged in the city, but did not re-enter municipal politics till 1911. He was member of Sydenham School Committee for eighteen years (and its chairman), did good defence work as a volunteer, and in general politics helped to found the Progressive Liberal Association.

"I believe in a Town Hall," is how he puts it, "but only the site should be acquired now. When the roads are right and other pressing needs satisfied then we can erect the building. I believe in the extension of the city right out to the sea, and in fact would like to see Lyttelton in, too. A canal would be the making of the city. Our most pressing need, however, is improvement of our streets and foot-paths by some such scheme as Mr Taylor's."

CR. JAS. MCCOMBS, M.P.

The senior councillor for Linwood, is an Irishman, who was caught and brought out very young, and though he has only been a City Councillor since April, he

was secretary of the first Burgesses' Association which battled for Greater Christchurch and public ownership of the trams, and State or municipal insurance schemes. He has thrice contested Parliamentary seats, Christchurch East (against Mr Davey) and Avon (against Mr Russell), being defeated by from 300 to 350, and Lyttelton, when he was elected. In the city's business he considers that after allowing for sinking fund and a small margin against contingencies, there should be no "profit mongering." Lake Coleridge light and power should thus be made available at the lowest possible cost, and the Council should adopt a similar policy with regard to fittings, which might also be put in on deferred payment as with water and sewerage connections.

Cool storage he would provide for all traders in perishable goods, also making available insulated cupboards or lockers for private consumers. Cool storage to be carried out in connection with a municipal fruit and fish market. Of which he says:—"The destruction of fish in this town each week is scandalous, and would supply thousands of homes. A market bringing producer and consumer together would reduce by 50 per cent. the cost to the consumer, and encourage producers to market supplies that now go to waste."

Regarding the "fifth plank" in the platform above given, i.e., the minimum wage of 1s 3d per hour to Council employees, Cr. McCombs points out that "it is £2 15s for a 44-hour week, a bare living wage." He holds that the Council should be the "model employer," setting its face against "sweating." "The men should be paid a living wage even if the rates have to be raised. It is immoral to keep down the rates by keeping down the wages of fellow citizens who for a livelihood are attending to the health and the comfort of the whole city. The Taylor rate-saving road scheme would mean better roads and savings that would more than provide for increased wages."

While admitting its complexity, he holds that no single problem in the city's provisioning demands more serious attention than the milk supply. "A number of milk-carts visiting each small street is also wasteful in the extreme. The municipality should take the milk from the producers, taking special care that cleanly conditions prevail at the sources of supply, and a central receiving and distributing depot with proper pasteurising appliances would then ensure reliable milk at a reasonable price." Regarding the Town Hall site, in which Cr. McCombs

takes special interest, he points out that the triangle in Victoria square where the band rotunda is, was set aside as a Town Hall site. "Originally, it was set out as a market square, and had no streets traversing it, not even Victoria street. An old map in the City Council shows it bounded by four straight streets, and only the river traversed the five and a half acres set aside for the people. Victoria street and Oxford terrace have cut it to pieces. The two small triangles now existent are half an acre and three-quarters of an acre, and, with the exception of the strips of land on the north and west bank of the river, they are all that is left of the people's park. If Oxford terrace were closed, traffic would in no way be inconvenienced, and the available lawn space would be nearly doubled. The green sward on the north side of Victoria street would reach right across the river, broken only by the Avon on the south side. The closing of that strip of Oxford terrace would similarly enhance the other side of Victoria square. Over an acre and a quarter would be converted from grey,

dusty streets to green, cool lawns, and on either side a site could be found for a Town Hall worthy of Christchurch. There would be no necessity to purchase a site, and the setting and position would be perfect. The total open space in Victoria square, taking it from building line to building line, is eight and a half acres, and a Town Hall somewhere near the centre would not restrict this."

Then if the Provincial Council site can be secured no more suitable place, Cr. McCombs considers, could he found for the erection of municipal offices, and the historic and beautiful chamber would be preserved as a fitting seat of government for a Greater Christchurch, taking in a radius of ten miles around, and certainly including the whole tramway area." He would then wish to see the functions of the Tramway Board and Drainage Board vested in the central controlling body, representatives to the new "Christchurch County Council" to be elected in proportional representation. A Municipal Central Library, linked up with branch suburban libraries, is a part of this vision of the municipal future.

CHAPTER XX.

FOUR "NEW" MEN.

There remains of the City's Directorate to be accounted for just four men. They are all new men—new that is to the Council Board, but each with a substantial stake in the city, and each representing in his private affairs some phase of the city's life. There is the head of a well-known manufacturing and mercantile concern, in Cr. Hayward; a well-known chemist in Cr. Loasby, a man of independent means and leisure of a type that should take more interest in city government in Cr. Morten, and head of a widely-known engineering firm in Cr. Scott.

CR. HAYWARD.

Taking them again alphabetically, Cr. J. R. Hayward, going on to the Board and looking at the conduct of the business branches from the business man's point of view is most emphatic as to the necessity of running the Coleridge scheme on strictly commercial lines. The city is not only committed to taking over the Coleridge current for sale on May 1st, 1914, it has also to take up the big

task of lighting the city in August, 1914, when the Gas Company's contract will have expired, and that alone involves great preparatory work. He is not impressed by the arguments that the city should keep stocks of fittings, and sell them as near cost as possible, and sell the current at the lowest possible price. Whether the city should keep stocks is a point for a competent man with a knowledge of the particular business, and also influenced by whether the firms here dealing with electrical fittings supply them to the public at a fair rate, and the councillor points out that it is only comparatively lately that the Gas Company has kept stocks after many years' conduct of the power and lighting business. He points out that no man can succeed in his private business who does not concentrate his energies and apply special knowledge to it; yet the electrical projects of the Council are on a huge scale, the opening out of a very great business, and only one man on the Electrical Committee can be said to have practical knowledge of it, and even his knowledge is not that of the

man who has conducted a similar business. The danger of trying experiments in policy that are well enough in theory, but may prove quite unsound in practice, therefore impresses this councillor, and he instances the New Zealand railways, which the State has been running for so long. Yet who would suggest that we have yet evolved the right system of management? In fact, at times of abnormal traffic, the department is quite unable to cope with it, and he foresees a similar danger in the working of the electrical scheme if care is not taken.

The abattoirs he judges to be a very live institution, managed on business lines, but requiring a system of bringing the meat in in closed cars on the tram line to a cold storage depot in town. There is, he believes, a good business to be done by the city in properly managed cold storage and the sale of cheap ice. The Committee is now considering a site. While not seeing the necessity for a fruit market this councillor thinks there should be a municipal fish market in conjunction with the cold storage, for he considers the reports as to good fish destroyed at the destructor during the year "appalling and shameful"—almost as much destroyed as consumed. He says that some of the fishmongers themselves are now beginning to ask for the market and cool storage.

As for the Town Hall, he considers it should be built right away, on the Town Hall reserve in Victoria square, and all the municipal offices, including the electrical department, concentrated in the buildings, and he would like to see the tramway and drainage offices, and similar branches of the city business, under the same roof.

The streets of Christchurch, he considers, are kept very well under the circumstances, but the tar-macadam should be pushed on, and the distilling plant got. Also, the distribution of sand on frosty places should be more strictly attended to for traffic's sake.

CR. LOASBY.

This is Cr. A. M. Loasby's first experience of municipal work, but he did good work in the old volunteer force as first captain of the Caversham Rifles in Dunedin, and captain of the Christchurch City Rifles. He has already struck out a line for himself in the Council in connection with the sanitary handling of meat, and secured the adoption of a motion:—"That it be compulsory that all meat taken from the abattoirs or other depot adopted by the Coun-

cil, be removed to its destination in covered-in, dust-proof conveyances, and carried from same to shops under hygienic conditions." It was seeing some very disgusting instances of dirty handling of meat that moved the councillor. In Dunedin proper conveyance is provided, and men handling meat must use clean white sheets. So long as hygienic precautions are taken Cr. Loasby is not particular whether the Council takes over the carriage, as it has the killing, of meat, or whether it is left to private enterprise, but he insists that it must be handled better than at present. Also, he is a strong advocate of a pure milk supply, and considers present inspection by Government officers unsatisfactory. Municipal officers should apply the tuberculin test periodically to all cows from which the city milk supply is obtained. He would carry the Lake Coleridge scheme to its utmost limits, but though he favours good roads, thinks the Taylor scheme too expensive. He cites Hereford street, which, he says, has only been tarred, as an example of how suburban streets should be treated, and thinks there is only necessity for the tarred macadam in the heart of the city where traffic is heavy.

Cr. Loasby wants to see depots established in the suburbs for the deposit of rubbish, which could be brought by motor-waggons to the destructor, considering the present horse and dray system wasteful. He is not in favour of borrowing except for essential works, and is absolutely opposed to any increase in the rates.

While he advocates erection of a Town Hall and municipal offices, he is rather uncertain as to municipal markets. The Sydney and Melbourne markets were failures, and he knows no successes in the colonies. At the same time, he thinks it essential to have legislation making it compulsory that all fish be sold at a municipal market.

Another high-level reservoir he regards as absolutely necessary. As a strong believer in a progressive policy, he favours a still Greater Christchurch, and amalgamation of the Tramway and Drainage Boards with the City Council.

CR. MORTEN.

Cr. A. Morten, like the rest, is making his debut in municipal life, but he is the type of substantial and level-headed man with a stake in the community, who should take a much more active part in municipal politics. He has given good service to that admir-

able movement, the Kennedy's Bush Scenic Preservation Board, and as president of the Automobile Association he has had to study the "good roads" question practically. His municipal creed he puts briefly thus:—A Town Hall in Victoria square; a cool store in town, meat from the abattoirs to be brought down in proper dust-tight vans; a road scheme involving the raising of a loan so as to do the streets thoroughly, instead of always patching; a municipal quarry; raising of the rates to be avoided, as they are high enough now, and the centre pays for everything.

CR. GEO. SCOTT.

Last, but far from least, comes Cr. Geo. Scott, of whom a fellow-councillor told me the other day that he was "the one practical man" on a certain important committee. Cr. Scott is a principal of an engineering firm known throughout the Dominion. His public service began with school committee work, some twenty-five years ago; the Heathcote Road Board. April 1st, 1897, chairman February 5th, 1904, still holding position; was member and first chairman Heathcote County Council, on which he still is; member Selwyn Plantation Board, and for many years member of the Selwyn County Council; present chairman and long a member Technical College Board; member Domains Board, Heathcote Valley Recreation Ground Board, and Hillsborough Domain Board. Some years ago he stood unsuccessfully for the City Council, but though he only came forward at the last moment in April he got in. Cr. Scott has always been practical in his local government work, and though Heathcote County has but a small revenue, it has effected many improvements, and is now seeing to water supply and drainage, and electric light for Cashmere hills, works to be accomplished within the next six months. Cr. Scott considers that in the past all councillors have not made themselves acquainted with the details of work undertaken, and mistakes have been made because councillors, not being experienced engineers, have had to rely

solely on the reports of officers. He approves Cr. McCombs's view that councillors should attend meetings of committees of the Council of which they are not members so as to get acquainted with details of the business before those committees, and he believes that the present Council will go more into the details of work than has been the case in the past.

As to future policy he is quite in favour of a Town Hall, and thinks that it should also be considered whether in the same block provision could not be made for municipal offices, cool storage and municipal markets, including a fish market. In his native town—Derby—all these are in one block, the Town Hall facing the main street, whilst the markets and cool store front a back street. There should be an additional reservoir. The city should take in residential portions of surrounding counties, and in view of amalgamation with outside districts, he hopes the Lake Coleridge scheme installation will be made comprehensive enough to be extended at the least possible cost, and, in this connection, Cr. Scott considers the electrical department will have to put its best foot foremost so as to get all the customers it can to open on May 1st, as the payment to the Government is to be on the basis of the July load, and May and June will have to be paid for by the Council at the rate of July, even though the rush of customers does not come till it has begun to popularise itself, in July.

Cr. Scott was born in Derby, England, 1851, and arrived at Lyttelton in the ship Ramsay in 1870. Twelve months after that he started in business with J. L. Scott as builders and contractors, securing the first contract let by the Government after the abolition of the provinces, which was an alteration and additions to the Immigration Barracks. After completion of this contract the Railway Foundry was purchased, and re-named the "Atlas," this being the name of a foundry in Derby, partly owned and managed by Mr M. Scott, the eldest brother. The growth since then everyone knows.



CHAPTER XXI.

ON THE GLORY OF A CITY'S TREES.

The already tree-set city of Christchurch is blessed with such a glorious opportunity as no other New Zealand city has. Within some six miles of the Square the city owns about 2500 acres of undulating sandhill country overlying shingle, covered with manuka, toi toi, tussock, with here and there plantations of big trees, the surface firm and dry, water always within reach of the roots, artesian water to be got anywhere. Some of this country is used for the ploughing in of night soil. Some of it is leased for grazing. All of it may be regarded as quite undeveloped, and bringing in no return worth considering. There are 1136 acres at Chaney's, 818 acres at Bottle Lake Reserve, 516 acres of the New Brighton "planting" reserve, extending from Bottle Lake to the sea.

WHAT MIGHT BE.

Picture to yourself what might have been made of this 2500 acres had it been systematically taken in hand twenty years ago, when some of the trees now on it were planted, and thoroughly planted with forest trees. It would to-day not only have become a great and popular resort of the people of Christchurch, a sight that visitors would have been taken out to be shown with pride, but it would have been a valuable and rapidly developing asset of the city, a sinking fund that "grew while the city slept." What would have been done with such a gift in Europe, where forestry has become a fine art, and great revenues are brought in to the State and the municipalities, and private individuals as a consequence? What of these old barons who planted trees whenever a son was born to endow him when he came of age? Trees in German forestry are planted two feet apart to get straight branchless stems, and the mutual protection of the natural forest, and to allow for loss and for thinning for commercial and cultural purposes. Two feet apart represents 10,980 trees to the acre, or 21,960,000 trees to 2000 acres. Four feet apart is, however, the distance approved for these particular reserves, and that would give, at 2722 trees to the acre, 5,444,000 trees to 2000 acres. What would five and a half millions be worth?

WHAT HAS BEEN DONE.

Mind you, it has already been proved that trees will grow well in these par-

ticular reserves. Everyone who has been on the railway or the road between here and Kaiapoi knows the splendid big trees that run along on the right of the line from Chaney's towards Kaiapoi. They shut off the Chaney's reserves from the railway. On the side of the road leading into the reserve are other great trees, and again across it. They are the only object lesson needed there. At Bottle Lake are similar object lessons. In 1909 experimental plantations were made at the city end of the reserve along Rothersey road. The trees planted were *pinus ponderosa*, *austrocarpus*, *maritima*, *muricata*, and *laricio*. These have done well. *Abies douglassii* (Oregon pine) and *abies excelsa* since planted have not done well. Last August Mr Robinson, the Government Supervising Nurseryman for the South Island, visited these reserves with Mr Dobson, the City Surveyor, and the result was a very interesting report from the latter to the Council recommending that it set up a nursery of the trees approved, and systematically plant these reserves at the rate of 50 acres a year. Mr Dobson estimated the cost at under £10 per acre, including fencing, preparation, trees, and four years' attention. He considered that the cost of thinning later could be met by sales for firewood and poles of the trees taken out.

THE PRESENT MOVEMENT.

The present Reserves Committee, under Cr. Dent, has taken up the matter practically and in a scheme prepared by the chairman and the head gardener (Mr Wickens) is not only buying trees for planting, but has also started a nursery in a portion of the Linwood Park. At present all the money available is £300 on the Council's estimates. The proposal is to deal with Bottle Lake first, and plant 50 acres a year with *pinus insignis* (these predominating), *ponderosa*, *austrocarpus*, and *laricio*. As a beginning an order was given for 45,000 trees. Of those planted in 1909-11 there are about 20,000 *austrocarpus* and 5000 each of *muricata*, *maritima*, *ponderosa*, and *mauritio*. They are from two to six feet high, according to age, but will make much more rapid growth as their mutual shelter establishes itself. In Mr Robinson's scheme, he advocated 100 acre blocks, each surrounded by a

row of poplars, and two rows of *muri-cata* or *maritima* for shelter, and a chain wide space for fire break and roadway between each block. The committee's scheme proposes 4ft apart in the rows, and 4ft 6in between the rows, in plots of 20 acres of *pinus insignis*, to four or five acres each of the others, on account of the quicker return from *insignis*. Presently there will be 10-acre plots of the others. The *insignis* everybody knows. The *ponderosa* is the "bull pine" of North-Western America, growing 100 to 150 feet, and furnishing durable timber. *Laricio*, the other mainstay recommended by Mr Robinson, is the "Corsican pine" of Southern Europe (100 to 150ft), a fast-growing pyramidal tree, and regarded as probably the best of the imported pines for timber purposes here.

£7,000,000.

And now one little note on the financial side—the figures are those of the chairman of the Reserves Committee, not mine:—

Total cost of planting 2500 acres, including loss of present rentals and interest at 5 per cent. for 50 years	£82,500
Value of timber when matured	£7,200,000
Yearly income at the end of 26 years	£57,600

The estimate of values is got at in this way:—*Pinus insignis* timber is being now sold at the yard gates at the prices above quoted. What timber will be worth 20 or 30 years hence when present sources are exhausted, no one can foretell with any certainty—the daily newspaper is eating up the world's forests at an appalling rate—but the basis is taken at present *pinus insignis* value, viz., 12s 6d, taking 2000 trees to the acre, allowing 33 per cent. for failures, allowing the trees at 60ft instead of the 100ft that they may be expected to grow to, taking a 12 by 12 plank from each tree, equal 720 feet, and the result as above. Cost of milling is put down at 8s 6d per 100 feet

GET IT DONE.

Whether the figures work out in practice or not to these surprising totals, there is no gainsaying that great profits are made in scientific forestry.

From every point of view it is a matter that the city should push on with, and my only objection to the present scheme is that at the rate of 50 acres a year it would take 50 years to complete the work. Would it not be possible to get the Government Forestry Department to assist, and get the thing "speeded up" generally?

CHAPTER XXII.

AN URGENT NEED.

THE TOWN HALL THAT IS TO BE.

It has been made abundantly evident that the city of Christchurch wants a Town Hall and proper business headquarters, and wants them badly; is losing money every day because its departments are not so housed and concentrated as to facilitate their work. There are two ways of looking at the question—(1) a central municipal block, including Town Hall and all administrative offices; (2) a Town Hall and administrative offices, but not necessarily in the same block or on the same site. It is suggested that sound business would also bring the Drainage Board administration into the municipal buildings, and generally departments affecting local government. The question of separating the Town Hall from the administrative offices has been raised chiefly in the case of the Provincial Council site. So far, sites suggested have been:—

Provincial Council buildings.

Victoria square.

Latimer square.

Cambridge terrace.

River bank opposite Canterbury Club or Public Library.

Hall and Son's premises, opposite Clock Tower.

Corner Manchester and Worcester streets.

"TOWN HALLS" THAT WERE.

Curiously enough, Christchurch, which now lags behind all the cities in Australasia in this particular matter, has had two "Town Halls" in days when it was a hamlet. In 1850 the site of Christchurch was fixed on the Plains, and in 1853 the pioneers were already proposing the erection of a "Town Hall," which was duly opened on October 1st, 1857, with "a public concert." "The room is really a very handsome one, and exceeds the expect-

tations of most of its visitors"—relates a chronicler of the day. This first Town Hall cost £780, but ideas grew rapidly, and in 1862-3 the second Town Hall, a stone one this time, was built at a cost of £3000. It was opened officially on September 16th, 1864, with "an amateur concert," in which "an orchestra of fifty to sixty performers" took part—the same orchestra performing "The Messiah" shortly after. This second Town Hall had a chamber 81ft by 34ft inside, with walls 26ft high, facade of Grey stone, and "dressings" of Governor's Bay tufa. There was "a small gallery for musicians," and "an ingenious contrivance by means of which a stage can be erected." In 1868 a supper-room was added. Alas, "earthquakes," we are told, "so unpleasantly prevalent in 1868, and the early part of 1869, had such an effect on the walls that after the severe shock in June, 1869, the building was professionally condemned." One wall was cracked from top to bottom. The building remained closed till March, 1871, when it was sold, land and all, for £3900. As the total outlay (with cost of land, £500) had been £4480, this was a substantial loss. Both these "Town Halls" of the past were where Strange's establishment now is.

AFTER MANY YEARS.

There remains the remarkable fact that since the 60's Christchurch city has not boasted a Town Hall, and now the time has come when there is a general feeling that the municipality should set about supplying the deficiency. A few years ago, I am told, a good opportunity was missed of securing the Agricultural Hall block in Manchester street (including His Majesty's Theatre) on favourable terms.

THE LATEST MOVEMENT.

Recently there was a new movement afoot to secure the Provincial Council building. The Mayor applied to the Premier, and there was a great deal of sentiment and reason in favour of securing it if it could be secured. It is historic. It is identified with Canterbury from the beginning of things. It is a noble building architecturally, and contains the finest hall of its type in Australasia. That hall would make an admirable Council Chamber, and Mr Massey very properly said that whatever Government might agree to, it would be conditional on the hall being preserved intact. As a City Council Chamber, it would lend dignity to the proceedings, and be jealously preserved as a treasured inheritance of the citi-

zens. The wooden part, the present Lands offices, could be replaced in stone, and a design, which would be a following of the existing one, might conceivably provide a very noble building for the carrying on of the city's affairs—the affairs of more people than all Canterbury owned when this artistic pile was erected for them. It is understood that the Lands Department would still have to be provided for, and the big strong-room in which the deeds and records and plans are kept would still be needed. Perhaps the present municipal headquarters could be made to house the Lands Department, and another fire-proof strong-room be built there.

OTHER SITES.

The Clock Tower site does not appeal at all. Neither does the acquisition of the brick terrace on Cambridge terrace. If any fresh site in the heart of the city were to be taken, the best would be where the Bank of New Zealand is, if it could be procured, when the awkward bottle neck into the Square could be opened out.

WHAT THE CITY HAS.

But it really wasn't necessary to speculate on the purchase of any of these sites, when the Firm had already a site duly and legally set apart for the purpose. This is Victoria square. With a very slight moving aside of Victoria street and the trams, it could be made still better without incommoding traffic, because it would give still more room on the northern side where the band rotunda is

A LITTLE HISTORY.

For this reason the history of the site as it appears on the original maps and plans becomes of special interest, and in this I must acknowledge the assistance of that faithful searcher of the past, Mr Johannes Andersen. The earliest of the maps show the Association's reserves at Lyttelton, otherwise Christchurch, and in that Victoria street figures as "Whatley road." The boundaries of the town were Antigua street (now Rolleston avenue), Salisbury street, Barbadoes street, and St. Asaph street. Opposite them was the noble endowment of the "Town Reserves," which, alas, went aglee in times of financial stress later. In these maps and ordinances the Square, or "Market place," occupied the whole space between the building lines without intersecting street lines. Within this space there was placed the Post Office, next the river on the north side of which is now Victoria square:

the gaol and immigration barracks, next Armagh street; a gravel pit where the band rotunda stands; and a Maori camping ground, where many meetings were held. It is an historical fact that the "opening" of the old gaol was celebrated by a ball in the building, the cells being used as dressing-rooms. A weekly market was opened here in May, 1853. The report of the event expresses pleasure at the good attendance—upwards of 50 persons. Here are some prices realised:—Barley 8s per bushel, oats 6s, potatoes £4 to £6, carrots £4 to £6, swedes £2 10s, seed wheat 12s per bushel, butter (wholesale) 1s 6d (retail) 1s 8d. A "Market Hall" was erected later. All of which is interesting in view of the movement to establish markets now—but that, by the way.

BECOMES TOWN HALL SITE.

Time passed, and the Christchurch City Reserves Act of 1877 vested all the reserves, including "all that plot of land called Market Place, bounded by Chester street and the Avon." Then, on March 6th, 1879, an Order-in-Council was gazetted changing the purpose of part of this square from a market-place to a reserve for Town Hall and Municipal Offices, 2r. 20p. This comprises the whole of the reserve north of Victoria street, and between Colombo street and the river; so that the city actually possesses an excellent site dedicated to the purpose for which it is desired to use it, and by skilled landscape gardening treatment of the rest of the reserve and the closing of the unnecessary bit of street between the Queen's statue section and the river, the building could be accommodated on the northern, or rotunda, section, set

in a picturesque garden which would actually give more ornamental and recreative sward and breathing space than at present, and give opportunity to build a Town Hall and municipal head offices, worthy of the city, in its very heart.

The whole site question was fully investigated by a committee of which Mr McCullough was made chairman. The Government did not appear inclined to hand over the Provincial Council site. The Committee favoured the Victoria square site. This is how Mr McCullough put the matter to me after the choice was made:—

"In selecting this site the Committee was guided by the fact that if land had to be purchased, it would cost at least £25,000, and with loss of rates to the city amounting to £370, together with interest and sinking fund, would entail an annual charge of £1745. This amount would provide interest and sinking fund on about £31,730. This action of the Committee and Council I endorse, and in the near future hope to see the city have a suitable Town Hall and offices which will do credit to a city like Christchurch. We have not any powers yet conferred upon us by the Council to float a loan for the above, but hope to report in a very short time to the Council what will be the requirements in the way of office space, etc., necessary for the different departments."

Well, it only remains to "get busy" about designing and building a suitable hall and administrative block. We have a site that will lend itself to a very fine one, and, properly designed, the Christchurch Town Hall should be an excellent investment for "the Firm."



IN THE BOTANIC GARDENS

The
Christchurch Drainage Board
and its Work and Workers,
Human and Microbic.

A FIRM WITH A PERSONALITY

There is a personality and individuality about firms as there is about individuals, and there is that individuality about W. H. Price and Son, the well-known brass founders and engineers, of 34-36 Manchester Street and Allen Street. It strikes you directly on entering, for the first object that meets your view is a portrait of the founder, the late Mr. W. H. Price. And that leads to the revelation of why this firm has a reputation second to none in its business throughout the Dominion, and is appealed to in particular jobs from the North Cape to Stewart's Island.

Mr. W. H. Price was apprenticed to the famous London brass and marine works of Jonathan Downton, whose pumps, invented in 1850, are still used in the Dreadnoughts of to-day. And behind W. H. was his father and his grandfather, who did work for Nelson's warships. The maternal grandfather fought with Wellington in the Peninsular. There is the accumulated wisdom of four generations of brass founders, down to the present head. W. H. was with Jonathan Downton for 35 years—the last 14 as foreman. That firm had 104 coppersmiths. In his time he was responsible for many a very fine job, and there was a singular instance of it in the late Turkish war, when a gunboat, for which W. H. had made all the gun-metal work in 1870, fought once more—over 40 years of war service. He also made the metal work on the great Eastern and other "mammoth" of the time.

In 1879 Mr. W. H. Price decided to establish himself in a new land, and came with his family to Christchurch, starting a pioneer brass foundry at Sydenham. It outgrew its Sydenham site, and in 1896 started in its present Manchester Street site, in premises four or five times as big. Now these premises have proved not half large enough, and they are being very largely added to. There is a two storey building, with a 50 x 40 pattern room, and 50 x 40 show room; a 66 x 50 fitting shop, 50 x 40 polishing and grinding and plating rooms; a new foundry, covering 120 x 60, and the place is packed from floor to roof with the firm's manufactures, which range from quaint but artistically worked mascots for motor cars and motor launches, from Masonic emblems and finely wrought badges, to ship's propellers, and a 500 cwt. fat extractor for the freezing works to stand a pressure of 10 tons to the square inch. There are engineers' steam work, all kinds of Fire Brigade and fire extinguishing appliances, launch fittings, church fittings, including beautiful candelabra, lecterns, vases, etc. You can see these things in the two Christchurch Cathedrals, and many of the churches of Canterbury and far beyond I have come across their work myself all over New Zealand, in fire stations, churches, banks, grids and screens in Post Offices. Every part of a motor car is made on the premises—from the horn to the carburetters—from the cylinder heads, piston and rings to the wind screens, and every kind of repairs is affected by the oxo-acetylene welding plant. Gear cutting of every type is a speciality, and car axle making. The firm's patent spraying pumps are deservedly sought after. They make garden sprinklers, electrical sundries, loco head light burners (a good example of metal spinning). Milking machines, and all their parts are another speciality with a large run, and windmill and various other pumps. A speciality for which the firm is noted are seed-sowing machines. They have made considerably over 250,000 of varied patterns. For all these things 120 tons of special metals are kept—copper, aluminium, spelter, antimony, anti-friction metals, chrome and nickel steel, etc.

The pattern room has over 1,000 boxes of patterns, and all numbered so that they can be available at any moment.

Mr. W. H. Price died in 1906, and the present head (his son, Mr. F. C. Price) carried it on. The business suffered a temporary set-back owing to the serious results of a bicycle accident to Mr. F. C. Price three years later; but on his recovery, he not only restored its previous prestige, but the misfortune appeared to put him on his mettle, and to draw out qualities and abilities previously latent, with the result that under his management continuous increase of premises and plant has been necessitated by the growth of the business which has gone on continuously ever since. Every Christchurch governing body that I have written of has the firm's work to show, and the Government of the Dominion is a regular customer.

Mr. H. Z. Price, foreman of the moulding shop, was also a Downton apprentice, and served a further term with a famous London fire appliance firm. He had experience in the best Australian shops. Mr. Garside is foreman of the machinery department. His father was 28 years foreman of a well-known Dunedin firm, and was himself in business there. And the staff of 36 are all practical men, trained to regard it as an unthinkable breach of honour and business integrity to let a piece of work go out with the slightest defect in it. One result is the reputation the firm holds. Another, the array of medals won at the Melbourne, Wellington, Dunedin and Christchurch Exhibitions, and during 20 years at the Canterbury Metropolitan Shows.

CHAPTER XXIII.

HOW CHRISTCHURCH WAS DRAINED.

ON THE SAVING OF 20,000 LIVES.

Once upon a time Christchurch was not drained. It was a more or less water-logged place, on the rich river delta of the famed Canterbury Plains. Up by the North Belt was a bog and even in Cathedral square, when Captain Thomas set about laying the town out in the '50's, was swamp. So when the population began to grow there was trouble. A flat town, it was difficult to drain by gravitation. Just before the formation of a Drainage Board and the initiation of the present drainage scheme, when the population of the borough was between ten and eleven thousand, the death-rate was 25.81 per thousand. Now it ranges about 10 per thousand. The excess was made up of what are termed "dirt" diseases, preventible disease which sanitation can cope with. Calculate what difference the drainage of Christchurch has made in the thirty years since its initiation and you will find that something like 20,000 lives have been saved. Twenty thousand people who would have died had the death-rate remained at 25, have lived to grumble at the drainage rate because the percentage has been brought down to ten. As a gravitation scheme emptying into the sea was impracticable; river pollution unthinkable. It became necessary to evolve a pumping scheme, and a sewage farm and septic treatment. The outcome interests vitally every man, woman and child in Christchurch. How many of them know anything about it? How many know how the problem was solved; where the pumping station is; where the sewage farm is; what happens at it?

THE FIRST BIG DRAIN.

Perhaps the first "big" effort to handle the surface water problem was a drain that was put in parallel with the South Belt, and about five chains to the north of it. It was continued by Ferry road to the Heathcote at Radley. The floor of the Cathedral is only fifteen feet above high water mark, so that it does not allow for much fall, but the surface drainage allowed for the carrying off of a good deal of the surface water to the rivers on either hand. As the town grew the demand for something more grew with it, and somewhere about 1872 the City Council put in a sewer. This was a bricked-in drain on the South Belt from Selwyn street to the East Belt; then

along Tuam street, to Ollivier's road. From there it was carried by open drain—what is now known as "the Pig-trough," to the Estuary. That was still purely for storm water and surface drainage.

ENTER THE DRAINAGE BOARD.

When the Christchurch Drainage Board Act was passed in 1875, it betokened the beginning of a new era. In the following year the Board got to work clearing out the rivers and the existing drains, and devising a more complete system of drainage to carry surface waters to the rivers. It was not until 1879 that a start was made with sewers as we now understand them, and the first was in the northern part of the city draining into the Avon opposite the Baptist Church. That sewer is still in use, but it no longer empties into the river. Instead it dips by syphon under the river, and continues to the pumping station. You can see the syphon shaft at the river side any day. To meet the physical conditions, the Board was compelled to adopt the always expensive process of pumping, and it also decided on a sewage farm. The handling of sewage as we now understand it, could not be undertaken till these two things were ready. So the first pumping station was put in at the intersection of Tuam street and Matheson's road in Linwood, and 451 acres of sandhill country to the right of the tram road to New Brighton, opposite Wainoni Park, was set aside as the site of the sewage farm. It says much for the success of the system that portion of that farm is actually used as golf links, and few of the thousands who go out on the New Brighton tram every summer holiday ever realise that there is such a thing as a sewage farm in existence.

BEGINNINGS AND GROWTH.

About the end of 1882 the pumping plant was ready, and the sewers having been connected to it, it began pumping on to the farm. That the system was not rushed is evident from the fact that by the end of 1883 only 57 of the 555 houses connected with the sewers had w.c.'s. In the following year only 37 more were connected, and in the first five years only 198 out of 844 houses. As the years went on, a complete change came over the position, and though ten years ago there were

still only 1384 houses containing modern methods of sanitation out of 3622 houses connected with the sewers, on the 31st March last, 30 years from the first return, there were actually 12,034 out of 12,398 houses "connected" which had w.c.'s, and there were 14,950 of these aids to sanitation in those 12,034 houses. Then there are 431 houses more connected with the storm water sewers, and 89 with the "duplex" (Richmond) sewers—a total of 12,918 houses connected with the system. To serve them and the city generally, there have been constructed 113½ miles of sewers proper: 18 miles and 42 chains of storm water sewers; and 1 mile and 35 chains of the "duplex" sewer, which is an old arrangement in Richmond for carrying away storm water and household drainage.

THE SEWERS OF CHRISTCHURCH.

As the matter stands to-day, the Drainage Board maintains over 130 miles of sewers, and over 127 miles of rivers and open water-courses. Those figures sound portentous, and conjure up visions of grim underground caverns and waterways such as have furnished so much weird material for writers on the sewers of Paris. The conditions, however, are slightly different. The sewers of Christchurch hardly furnish for the visitor the sensation of mysterious boating expeditions by flaring torchlight past swarms of "sewer rats," biped and quadruped. The sewers of Paris have harboured many a refugee from persecution or justice. The sewers of Christchurch are not built on that generous scale. You can make tours in them if you care for it, but as the biggest is

4ft 9in, you must either be a very small man or will presently own a very achy back. The smallest is 6in. The sewers proper are egg-shaped, the egg standing on end. The storm-water sewers are mostly round, and range from 4ft 9in to ordinary 9in pipes. They carry storm and other surface waters to the river, and are quite clean places to ramble in, for the sewage proper has to be kept separate, because of the pumping required; and of the fact that the quaint beasts which the city has harnessed up in the business of converting its sewerage solids at the sewerage farm into harmless elements will strike work if too much clean water comes with the dirt they have to operate upon. The rivers, too, must not receive anything but the clear streams you see running along in the side channels. So the two systems—sewage and storm-water—are quite distinct.

THE PERILOUS QUICKSAND.

The great enemy of the Christchurch sewers is the quicksand. The shingle is too far underneath to give any trouble, but quicksands may develop anywhere. A tiny leak may gradually create one, and then the sewer will crack or collapse into the hollow formed. Sewers that have stood twenty years of service will suddenly cave in this way. The passage of a road roller or a traction-engine over the surface may start the trouble. There is one place in Tuam street where Mr Cuthbert found it necessary to put down 20ft ironbark piles driven to 31ft below the surface. Resting upon them is a specially-cast iron pipe 15ins in diameter. That was the second time that the sewer had had to be replaced in that particular locality.



AT THE CLOCK TOWER.

CHAPTER XXIV.

FROM PUMPING STATION TO FARM.

HANDLING SEWAGE.

Since the pumping system was inaugurated there has been a constant extension of plant and operations as the city grew. At first there was only the one pumping station with a couple of surface condensing steam engines pumping through one 24-inch main. In 1908 suction gas was installed, two 100 h.p. producers generating the current to operate three centrifugal pumps. These pumps pumped through another main of 27 inches. Now the Board has got as far as gravitation will allow. It cannot carry away any more sewage without more pumping stations. There are four low-lying zones, the sewage from which has to be pumped twice. For these there are electrical pumps, two served by the city current generated at the destructor, and two by the tramway current. The stations are opposite the Public Library; on Oxford terrace at Bangor street; and on the river side at the end of Templar street. A fourth is on the same side of the river at the end of Avon glade, and a fifth will also be on the river side, but at the extreme north-east corner of the city at Richmond. This Avon-glade station, the latest to be constructed, is interesting in that through it the sewage actually passes twice under the river by syphon—first by syphon under the river at the end of Linwood avenue and then back again at the Fitzgerald avenue, on its way to the main pumping station. This is to save the expense of the immediate construction of the fifth station, which, of course will come some day.

AUTOMATIC.

The pumping stations are interesting places. The sub-stations are quite automatic—just look after their own business and attend strictly to it. The sewage runs into a tank at the end, and, as the tank fills, a float rises and closes the switch, which immediately connects up the current. The pumps at once get to work, and lift the contents of the collecting tank into the higher mains, whence it flows to the main station at Phillipstown, in the Linwood ward. As the emptying of the tank lowers the float, the switch again opens, and the current being thus cut off, the machinery ceases work of its own accord till there is work for it to do again.

GOLF BALLS AND CORKS.

Meantime, at the big station pumping goes on right round the twenty-four hours. When the sewage arrives at the covered receiving tank, it has to pass through a screen on which rakes (attached to an endless chain-work), bringing up corks, rags, paper, and flotsam and jetsam generally, golf and tennis balls that might be rather indigestible to the pumps. Why golf balls should come through isn't clear, but they do. The commonest "foreign" article, however, is the cork. It would really seem as though someone in Christchurch was consuming fluids stored in bottles—say hop beer, or sauce, or paregoric—though all the corks hardly appear to be of the type used for confining those explosives. They come through by the scores of thousands, and as they float in the tank, have to be cleared periodically by manpower. What is taken out at the screen is carted to the sewage farm.

BURYING A NOISE.

The machinery at the station is kept in ship-shape fashion, and the old steam plant is ready to take the place of the producer plant in case of emergency, or in times of special pressure. One of the problems was the disposal not merely of the "loud" smell (which the free use of disinfectants at the screen practically does away with), but the loud noise of the exhaust. It was like artillery practice when the producer plant was first introduced, and so it sorely disturbed the good folk of Linwood, some of them anti-militarists. Then a learned expert devised a plan for shooting the noise into the big chimney. That converted the salvos of artillery into a particularly effective fog horn, and even the "militarists" of Linwood did not care for the suggestion that fogs were always with them. Finally a hole was dug in the ground, and the noise buried there, and allowed to wreak its fury against a wall. It no longer worries the surface dwelling Linwoodites. Those below ground (in the municipal cemeteries) can't object.

THE FARM.

The screened sewage flows through the three centrifugal pumps driven by as many 40 h.p. motors, and they send it out to the sewage farm a little over

a mile and three-quarters away. On its journey it has to rise 26 feet—7ft 6in of which is a final lift at the finish, so that the pumps are driving over five million gallons of sewage 26ft up and $1\frac{1}{4}$ miles along in every 24 hours. You get to the farm out in the New Brighton sandhills by leaving the tram at Sandilands, on the town side of Wainoni Park, and proceeding down Karney's road to your right; or you can go down Breeze's road to the golf links that are on part of the 451 acres of the farm—a non-irrigated part—and through the splendid pinus insignis avenue of Cuthbert's road (to Bromley) that bisects the treated part of the farm. If you do this, you will be struck at once by the splendour of the pine avenues both within the farm fences and on the road, the vivid green of the irrigated paddocks and the sleek, well-fed appearance of the cattle upon them.

TO THE SEPTIC TANKS.

The "treated" part of the farm from the entrance channel to Dyer's road is just about half a mile through. The two big iron pipes—24in and 27in come in under the sand through the heavily-scrubbed sandhills that afford such warm shelter to stock. At the end of the pipe line is a concrete channel raised 7ft 6in to allow gravitation to do the rest, and there is a cut-off which permits in the event of storms of the whole water that may then find its way into the sewers, being turned direct into side drains, flowing to the Estuary, and so saving the pumps the extra lift and the septic tank the undue disturbance of rain water. There is a separate system for the disposal of storm water, and already noted, but it is impossible to keep all storm water out of the sewers.

WHERE THE MICROBES WORK.

Normally, however, the sewage flows to a septic tank of 3 million gallons capacity, $1\frac{1}{2}$ acres of tank divided into two sections. The inlets are all controlled so that the sewage flows in with a minimum disturbance of the mass already there. The whole surface of the tanks is covered with a "mat" of solid but odourless matter (half of it grass covered) the product of bacterial activity. For it is on the work of an army of these microscopic helpers that the city of Christchurch relies for the disposal of its sewage, and the "mat," which they themselves form, provides them with the darkness in which they are willing to work. For in the septic tank the work is entrusted to the anaerobic bacteria which

thrive in the absence of oxygen, and so want to be shut off from air and light. Give them those conditions and they tackle all offensive solids in the sewage and disintegrate and liquify them. The fact that five million gallons has to be disposed of every day in a tank holding three million gallons (from which you must deduct a foot of "mat" out of the 8ft 6in of depth), governs the time the busy anaerobes can be allowed for the job, but they manage to put in very good work.

PINES AND PADDOCKS.

When the very much improved fluid passes out of their department, it is let into the intersecting channels and then sent along a main channel under a really magnificent avenue of pines. On either side of the tree-shaded main channel is the irrigation farm proper, the first section of which consists of twelve 2-acre paddocks—six on either side—levelled out of the sand hills, and each with its entrance and effluent drains, and its frame of osier willows. The lifting of the sluice gates floods the paddock operated on and its luxuriant Italian rye grass, just to the extent desired, it being premised that the main consideration here is the disposal and conversion of the sewage, and not the crop. Therefore there is more irrigation than the ordinary irrigating farmer would require—enough in fact to make a rice field of it if desired—yet the grass thrives, and the cattle thrive on it, splendid artesian water being provided, in troughs, for the latter to drink, all piped round from a 400ft well. Some of the paddocks are cropped, and under the towering pines there are usually sacks of mangolds and carrots 300 yards long, which are carted out to the stock, there are big stacks of oaten straw, too, and eight-ton crops of potatoes are grown in the sand enriched by the flowing sewage effluent.

MORE MICROBES.

These sand paddocks are really so many workshops for the second set of Drainage Board employees, the aerobic bacilli, whose business it is to nitrify the sewage. Unlike the anaerobic workers, the aerobes want a lot of oxygen, and like light, so, as the sewage pours over the upper rim of the sand paddocks and disappears amongst the thick sward of grass, you see the bubbles coming up everywhere showing that the sand is air-charged, and down there the aerobes get right to work on what the other fellows left to finish. This is "intermittent filtration," and when the sewage reaches the effluent drains at the lower side of each pad-

dock and starts to flow to the big outlet drains that will carry it to the estuary, it is clear and sparkling as clean creek water and practically odourless. Man has utilised the processes of Nature to prevent Nature's pollution, as well as increase Nature's production, and all is well.

FARMING THE FARM.

What is said of the older section of the farm south of Cuthbert's road applies also to the section north of it, to which the main channel from the septic tank continues. Some of the paddocks in the first section have been down for 27 years. The new section has only been down seven years, and consists of sixteen paddocks of from 4 to 7 acres each. There is another splendid avenue forming here, the trees already 20 feet high and growing luxuriantly. Altogether the system has been a great success, and the farm manager, Mr Nankivell, appears to know his work well. He has only to do with the management of the sewage because the grazing and the cropping is leased to Mr J. Cochrane, a cattle dealer and dairy farmer, who has had as much as 500 head at a time on the place, and farms it well. Still, the Board might well farm it itself. Even the portions enclosed along the drains are capable of profit. This the fine growth of some raspberries, put in experimentally in place of osiers for which the demand has fallen off, shows. Crops like lucerne ought to do well, so should fruit. What potatoes, roots and grass will do is to be seen already.

WHAT IT COSTS.

It costs a lot of money to drain a city and give it the cleaner and more seemly, civic life, the necessity for pumping being, of course, a big factor. There is an average of 3534 gallons of sewage pumped in every minute of the 24 hours, a total of 5,088,687 gallons per day, and that runs to just 1d under £6 a day working cost. On March 31st last there was £359,692 due for loans, and £3230 due to the bank on overdraft—say £363,000, as representing the capital cost. To get at the present position, take off £103,332 of accrued sinking funds, bringing down the loan indebtedness to £256,000 odd—just over the quarter million—and put £6000 odd of uncollected rates against the overdraft. The expenditure for last year totalled £37,403, but of that £17,614 was for interest, and £2373 was put away in sinking fund, while £6228 was for new works, so that it costs a little over £11,000 a year in working expenses to keep over a thousand Christchurch folk out of the

cemetery every year, and make the lives of the rest pleasanter than they would otherwise be.

The money comes from rates which the Board strikes, and the City Council and other bodies concerned collect. This year the rate is from one-twentieth to three-fourths of a penny on the capital value, and that is decided according to the service rendered. Over the sewered area, for instance, it is $\frac{3}{4}$ d. Over New Brighton, where little has been done so far, it is one-twentieth. In between the two extremes come "rural" areas, where there are only surface drains, and where the rate runs from one-sixteenth to one-seventh. Of course, all benefit by the general draining of the surface, and the keeping of the rivers and watercourses clear.

THE GOVERNING MACHINERY.

The administration of all this is in the hands of a Board that consists just now of Messrs F. J. Barlow, S. C. Bingham, Fred Burgoyne, John Down, Walter Hill (chairman), Henry Holland, H. Langford, H. J. Otley, John Richardson, S. A. Staples, Fred Storey, and Wilfred John Walter—the last-named is off to England to gather in enough millions to pay for the drainage of Christchurch several times over. The ratepayers elect the Board every three years. The chief executive, and also constructive officer, is Mr Edwin Cuthbert, who is both engineer and secretary, and has been with the Board since 1881. Before that he was in the Public Works Department and on railway construction. He has as office staff two strongly named clerks—Messrs Champion and Senior. Then there is Mr Tomlinson, the chief inspector, with two sub-inspectors to assist him with the house connections and outside surface drainage. At the pumping station there is Mr A. S. Forrester, mechanical engineer, holder of a first-class marine certificate, and with the sort of experience that makes the handiest of men, and Messrs Tilman, Mitchell, and Broome as engineer assistants. They also hold first-class certificates.

OTHER BRANCHES.

The "head flusher," Mr P. Hobden, has four assistants. Their business is to see to the flushing of the sewers so that they may be kept sweet and clean and clear of obstruction. It is usually done by the pulling of valves from the flushing tanks, but sometimes, of course, they have to get into a sewer and explore it, though not often. Then there is the "river gang," under Mr

R. Meynell, directed by Mr Tomlinson. The rivers are cleared by means of Brobdingnagian "lawn mowers," dubbed "weed cutters" and "grass cutters." And the aquatic weed that was introduced to make the trout feel at home is cut by a primitive but apparently effective arrangement of scythe blades on fencing wire, which is "sawed" along by two men working on either side of the river. The maintenance of the drains is arranged in districts under half-a-dozen contracts. The sewer-laying itself is by contract.

Altogether the Board rules over about 60 square miles. Its jurisdiction extends to the Styx bridge, and a line due east and west of that to the sea. That is about $4\frac{1}{3}$ miles north of the Square. From the Square it is four miles to the furthest point west, $5\frac{1}{4}$ miles to the sea due east, and south by the Heathcote about $2\frac{3}{4}$ miles. And the health statistics, and the general sweetness and cleanliness of the beautiful tree-set waterwashed City of the Plains testifies to the fact that the Board's rule is beneficent.

THE BARNET GLASS RUBBER COY. LTD.

To every Australasian user of a rubber tyre, whether for motor car, motor bike, or "push bike," the name of "Barnet Glass" is familiar, but few, perhaps, know the history of a concern that has grown so big in so short a time. Its New Zealand headquarters are at Cashel Street. It has only been established in New Zealand for two years, but it pioneered the rubber industry in the Southern Hemisphere.

While thus interested in the rubber business, Mr. Barnet Glass was handling one of the best-known European motor tyres. He saw what was necessary for the peculiar conditions of Colonial roads. He found that to get this he would have to manufacture himself, and so he sent his Works Manager to Europe to study the very latest and best methods of making motor tyres. Then the capital of his Company was increased to adequately handle this department, and the manufacture entered upon. That was about five years ago, and the Barnet Glass tyres have never looked back. They have been rolling over tens of thousands of miles of rough road surfaces, and building up a reputation for imperviousity to puncture, and for extraordinary wearing qualities, that makes every user into an enthusiastic advocate. It is claimed that the department so developed is the largest and best equipped of its kind in the Southern Hemisphere, and that much of the success of this is due, not merely to the quality of the rubber and the care shown in the manufacture, but also to the scientific construction of the tyre sections to resist the great strain put upon motor tyres in every day use, and this last feature has met with the highest commendation of motor engineers and experts.

The New Zealand Manager, Mr. Goodhard, has had a very wide and interesting experience, and he will readily place the value of his experience at the disposal of those who want to know all about tyres.

As the General Manager for New Zealand (Mr. A. Goodhard) was for 3½ years in charge of the Taxi-Cab Co. Ltd., of Melbourne (the largest concern of its kind in the Southern Hemisphere), his experience and knowledge of what is required for motor cars, and the size of tyres, etc., that are best suited to the various makes and weights of cars should be of the greatest value to local motorists.



JACK CANNOT SAYS YOU CANNOT BEAT IT!

A GREAT THING FOR CANTERBURY.

THE NEW HOMEBUSH MINE AND ITS 4,500,000 TONS OF COAL.

The brown coal mine on the Deans Estate at Glentunnel for years past has supplied a good part of Canterbury with coal, the bakers of Christchurch, the brick makers and potters, the gas producer plants all using it, and householders mixing it with the bituminous coal. After taking out 300,000 tons that mine is closing down.

But Canterbury has a much better mine now opening on another part of the same estate, by the same proprietary. A railway line has been constructed for $3\frac{1}{2}$ miles from Coalgate station up the Coalgate valley to the new seam, and the plant at the mouth will be so constructed as to give a most efficient and economical service for an enormously enhanced business. The railway is the full Government gauge, and was constructed by those well-known contractors, the McLean Bros., so that, instead of loading coal into small skips, it will be loaded direct from the screens at the shaft itself to the Government railway trucks for distribution all over Canterbury. The immense advantage of this to the consumer as well as to the proprietary is obvious, for the knocking about and handling which most coals have to undergo will be thereby obviated, and the evil of broken coal, where it has to be shipped and much handled, largely done away with.

The development of the new seam and mine is of the greatest importance to the whole community and industries of Canterbury. Instead of being separated from the consumer by mountain ranges or sea, it is right at their doors—only 40 miles from Christchurch—and with a gentle run down—a drop of 800 feet in the 40 miles.

And the factors that should be borne in mind by consumers are that it is :—

A local product

Of the largest Colliery in Canterbury.

The coal is clean, does not go out, and mixes well with West Coast and other bituminous coal.

It is a fairly good steaming coal, but strong points are its even burning properties, cleanliness, and cheapness—practically a household coal.

And you can be supplied any time by ordering it

FROM YOUR COAL MERCHANT OR REESE BROS. (LOCAL AGENTS).

HOMEBUSH BRICK AND COAL COY. LTD.

178 ST. ASAPH STREET, CHRISTCHURCH.

The
Christchurch Tramway Board
and its
Complete and Efficient System of
Municipal Trams.

CHAPTER XXV.

THE TRAMS OF CHRISTCHURCH.

There is no more familiar object in the streets of Christchurch than the trams. The people own them. They are the "Transport branch" of the big business firm that every citizen is a shareholder in. The people use them to an extent that, when it is reduced to figures, seems almost unbelievable. There are only some 83,000 people in Greater Christchurch, that is, including every babe-in-arms and invalid, and folk who are shut in in places where they don't let them go out for tram rides. Last financial year—covering 1912-13—the Christchurch trams carried over sixteen million passengers. The exact figures were 16,060,441. That would allow for 1093½ rides in the year, or more than three per diem, for every one of those 83,000 people. But as babes and very little children are not charged for, they do not figure in the sixteen million odd rides, and as there must be a good many of these in the 83,000, the actual number of passengers carried can be put down at greater than the sixteen millions, and the percentage higher, so far as local folk are concerned. Against that, again, you can put the visitors.

A RACE OF TRAM RIDERS.

Unquestionably the people of Christchurch may be regarded as a race of inveterate tram riders. They have the "tram habit," that peculiar psychological phenomenon, the obsession which convinces the man or woman who has become accustomed to trams, that legs were merely provided to carry them to the nearest tram stopping-place. To such folk each stopping-place is an isolated island, surrounded by impassable streets which can only be negotiated in a car, and though it might take only ten minutes to walk to the destination, and it will be fifteen minutes before the next tram is due, the average Christchurch citizen will wait patiently those fifteen minutes, rather than "walk on." That, of course, is good for (tram) "business," and as it is your business it is all right. In spite of this pronounced development of the "tram habit" on the part of the people of Christchurch, what proportion of those who daily use the trams—their own property, mind you—really know what they stand for, know the elaborate organisation, the complete

machine that has been built by this particular branch of their own "firm?" Know what is behind their penny tram ride, and what thought and care and brains have to be exercised by everyone, from the cleaner up to the controlling head, in order that they may find their tram just when it ought to be there, and take their ride upon it in safety?

IN THE PUBLIC EYE.

Trams and tramways—and the foot-boards thereof—were much in the public eye in consequence of the movement which in 1913 brought about the Tramways Act Amendment Act, even though the folly of the watersiders was then taking up so much attention. The circumstances the Act is to meet are not circumstances of Christchurch so much as Wellington, where narrow streets and narrow tram lines with big two-storeyed trams racing along crowded ways at a pace which always seems dangerous under the conditions, have proved veritable juggernauts. Christchurch, with broad streets, broad gauge, and the broadest trams in New Zealand, will be affected by this conflagration that has flared up in Wellington, and the people's transport branch will have to put its hand in its pocket in consequence. Still, it has the consolation of knowing that it has both less to convert than Wellington, and what it has to convert will be much more easily converted than the rolling stock of the Wellington citizens, because of this matter of width.

THE BEGINNING OF THINGS.

I don't know what were the first trams in Christchurch. Probably, saw-mill trams and rails laid down by enterprising settlers to carry bricks and the like.

The first line of note that I can hear of was a wooden tram line which came past the Sunnyside Mental Hospital, and along Lincoln road, to bring in stone from the quarries. That was working in the 60's. There was an extension of it towards the back of Lake Ellesmere to bring timber from the Bays and Little River to town. Mr Wood was a leading spirit in the enterprise, and it was built by Mr Wm. White, who built White's bridge on the way to Kaiapoi. You can see

traces of the old tramline still round the hills and along towards Halswell—stonework of the track and the like.

When the making of a railway system was under consideration, one well-known citizen of the day actually proposed a scheme to have a horse tramway from Christchurch to Rangiora, instead of a steam railway.

WHEN THE BOARD TOOK OVER.

It was a long time after that before Christchurch got real tramways, as we understand them now, but when the decision was come to to municipalise the trams, there were three companies in active operation. These were the Christchurch Tramway Company, Ltd., with eight miles of (steam) line to Sumner; 2 miles 63 chains (steam and horse) to Papanui; 2 miles 44 chains (horse) to Dyer's Pass road; 2 miles 76 chains (steam and horse) to Addington, via Colombo and Tuam streets and Lincoln road, to Show Ground; and 34 chains (horse) via High street, to the railway station. This last line was never taken over by the Tramway Board, as it was pulled up before the Board purchased. The New Brighton Tramway Company, Ltd., had 5 miles 44 chains of (horse) tram line from the Square to the beach, via Worcester street; and the City and Suburban Tramway Company, Ltd., ran 7 miles 52 chains of line from the Clock Tower to North Brighton and the Pier. So that there were, when the Board took the lines over, 21 miles 67 chains of single track, as against the people's present possession of 68½ track miles in operation, or, excluding double track and loops, 53½ route miles of single track, and eight of double track—61½ total route miles.

THE EARLIER LINES.

The Canterbury Horse and Steam Tramway Company began the running of its lines about 1879-80. The leading spirit in the promotion of that enterprise was Mr John Evans Brown, an American with Yankee "hustle," who got the company going, and was its first chairman. He was succeeded by Mr C. W. Turner, and then by Mr Robert Allen, of Lightband, Allen and Co., now Skelton, Frostick. The last chairman was Mr R. M. Macdonald. He held office for the last twelve months of the company's existence but saw that it could not go on as things stood. An effort was made to sell it out as a going concern for £10,000, and it was offered in New Zealand and Australia unsuccessfully. The city had a great opportunity for municipali-

sation then, and it lost it. Later it had to pay the company which took the trams over a very much larger sum—but that is getting ahead. Mr Macdonald got the debenture holders who had taken over the assets of the company, which went into liquidation, to put in more capital, and formed the Christchurch Tramway Company, Ltd.

THE LINES CONSTRUCTED.

The first of the lines constructed was out to Papanui, from the Square. Then there was a section from the Square to the railway station via Manchester street. It was the portion in Manchester street that was subsequently pulled up and the company merged in the Christchurch Company. Next came the Square to Woolston, to Addington railway station, to Sydenham as far as the Park (then the show ground), followed. Next the Woolston line was extended to Ferry mead—the Ferry bridge, and there it stopped for many years. Busses used to meet the trams and take the people on for Sumner, and there was nearly a tragedy through the rivalry shown. Mr W. Hayward owned the chief line, and the character and keenness of one section of the opposition was illustrated by deliberate "driving off" tactics which resulted in a serious accident to Mr Hayward.

People interested in the trams even ran a steam ferry service to connect with them, but it was never a success. Folks preferred the coaches, and finally the tram rails were laid on to Sumner and opened to traffic in the late 80's.

Later on the Christchurch Tramway Company extended its lines on the Lincoln road to Sunnyside, and through Sydenham to the foot of the hills at Dyer's Pass road.

"WELL HORSED" TRAMS.

They must have been rather dashing affairs, the Christchurch trams of the later horse period. They were wont to have four-horse teams—the only "four-in-hand" trams I have ever heard of. The tram horses had to be good trotters and fairly heavy to stand the strain of starting, and the hard roads and hard work soon played up with their legs and feet, and they were sold. As they were still a fine stamp of horse, there was always a demand for them from the farmers, and it was one of the jokes of the day that when a farmer bought one of them he also bought a whistle, and conveyed his orders with it—the tram horses were accustomed to start and stop to the whistle.

TWO "MUNICIPAL" VENTURES.

There were two early "municipal" tramlines. First the City Council laid a line from the old Council yards, opposite the Clarendon Hotel, through the Square to the Cemetery. The rolling stock consisted of two passenger cars, and one tram hearse. This last was the idea of a Councillor of the day. It was fitted very cosily to carry four corpses at a time, the idea being that the provision of comfortable tram travel and the prospect of a funeral on rails would induce citizens to so arrange their demise that they might be buried in batches on the half-holiday. Then the two passenger cars would be profitably employed in carrying the combined funeral parties—mostly as "strap hangers" presumably. With two smart black horses to draw the hearse it was calculated that it would prove attractive enough to literally "raise the dead."

A "CREAMERY"

Following this, the brilliant genius upon the Council who had designed the tram hearse contemplated a further attraction which he was wont to refer to as a "creamery." This was no inspiration as to the coming greatness of the dairy industry. In the contemplated establishment the cream of the community was not to be churned, but baked. It was, in fact, to be a crematorium whereto the rail hearse was to carry its still foursomes. But alas, it was one of those schemes o' mice and men that "gang aft aglee." The "creamery" was never established. The hearse never led a funeral, and the Council leased its mortuary line to the New Brighton Tramway Company. On the Sumner Estuary, near the Heathcote bridge, is a rather quaint "house-boat." That was at one-time a tram hearse. You have heard of folk who ordered and slept in the coffin they

were to be buried in, so that there might be no misfit through leaving the order to strangers for post-mortem execution. Yet "Saturday to Monday" in a hearse has a certain original savour. Another municipal tramway was constructed for the removal of rubbish in the pre-destructor days.

OTHER TRAMWAY ENTERPRISES.

The New Brighton Tramway Company was formed to take over the city's "dead-end" line to the cemetery, and carry it, instead, to the life-giving breezes and surf of the beaches, and it extended its line to the Pier. That line was operated by horse power.

Some of the property holders, by the way, developed grievances along the route, and one of the comedies of the day rested in the periodic interviews between the solicitor for the company, afterwards to win judicial honours, but who happened to be diminutive in stature, with a particularly large and masterful lady who was wont to express her views of the unfortunate solicitor, his company, and its tram line, with most embarrassing freedom.

The City and Suburban Company was formed for the purpose of constructing a line to Burwood, via Cashel street and Stanmore road, then on to Burwood, via Stanmore road, then to New Brighton racecourse, and so to North Beach, and then south to the Pier. This was in opposition to the New Brighton line proper, and was principally owned and entirely run by Mr John Brightling.

The North Beach extension proved the haystack this particular tram-camel could not hump, and the whole line was taken over and operated by Mr Brightling, who had constructed it.

That was the position when the municipal tram services began to be discussed in earnest, and just how the idea was brought to fruition I will tell you next.



CHAPTER XXVI.

THE TRAMWAY FRANCHISES.

The three companies and other companies which they had swallowed at different times, all laid and worked their systems under "concessions" secured from the various local bodies through whose districts lines passed, or were to have passed had they all been constructed. These were equivalent to the "Street Franchises" of which we hear so much in connexion with American agitations as to municipal "graft," and which appear there to have given rise to an extraordinary amount of bribery and corruption. They do not seem to have done those who secured them legitimately a great amount of good here. They were issued for various periods and under various conditions. For instance, the line from the Square as far as Devon road, Sydenham, was constructed under one "concession." Another "concession" permitted construction from Devon road up to the boundary of the Heathcote Road Board territory. Still another (issued by the latter body) authorised the bit of line on to Dyer's Pass road. Thus the line from town to the base of the Hills was built under three separate sets of concessions, and as these concessions did not all expire on the same date, it was quite conceivable that on any line running through two or three local districts a middle section might lose its privilege of running while its end sections, completely isolated, retained their's, so that nothing short of an aeroplane connexion would do them any good.

In this particular case the central area, controlled by the Christchurch Tramway Company, was under a deed of award made by Sir James Prendergast as Chief Justice, and which expired in September, 1904. The award had been procured because on the expiry of the past 21-year franchises the municipalities were not prepared to take them over. So the periods were extended by the Chief Justice. In 1900 the question of what should happen when the extension expired and the central division would revert to the municipalities began to be discussed. That was how the agitation for the municipalisation of the tramways commenced.

THE ARGUMENT OF AUCKLAND.

The Auckland Tramway Company, of British Electric Traction Company's creation, had just been formed.

Its promoters were very anxious to get Christchurch on similar terms. Though the Christchurch Tramway Company, which had taken over its lines on a low capitalisation, was paying, the rest of the companies had had such a bad run that a considerable body of opinion favoured the responsibility of extension being left to private enterprise rather than that the citizens should be saddled with it. This view was emphasised by the contemplation of the large sum which would be required to electrify the systems and bring them generally up-to-date. So the Auckland promoters found a considerable amount of support, some of it in quarters where it would not be forthcoming now that there has been time to get experience of private working in Auckland, as against municipal working here. Greater Christchurch had not then advanced to the stage it has since achieved, so that there were many more local bodies with a say in the matter, and a series of conferences was held. At these the advocates of municipalisation triumphed. Included among them were Mr Rollitt (then Mayor of Sumner), the Hon. H. F. Wigram, M.L.C., Mr T. H. Davey, M.P. (then Mayor of St. Albans), Cr. C. M. Gray (of the City Council), and the late Mr A. B. Morgan (representing the Avon Road Board). At one stage the late Mr T. E. Taylor addressed a great meeting in the Canterbury Hall in support of the municipalisation policy.

WHO SHOULD CONTROL.

The principle of municipalisation having been decided upon, the next question was whether the City Council should control the system. Some of the suburban municipalities did not like this idea, and the result was the constitution of the Christchurch Tramway Board under the Act in 1902. That is the body which has developed and controlled the system ever since, and extended it from the 21 $\frac{3}{4}$ miles it took over to the 53 route miles in daily use now.

THE TRAMWAY BOARD.

The first Board was elected on January 21st, 1903, and consisted of the Hon. H. F. Wigram, Messrs Wm. Reece, Geo. G. Stead, and A. W. Beaven, representing the combined dis-

tricts of old Christchurch City, Sydenham, and St. Albans. Linwood returned Mr Herbert Pearce; New Brighton-Avon, Mr A. B. Morgan; Woolston-Sumner-Heathcote, Mr Geo. Scott; and Riccarton-Spreydon-Halswell, Mr Frederick Waymouth. Mr Wigram resigned in 1904, and Mr G. T. Booth, who succeeded him, resigned less than a year later, and was succeeded by Mr C. M. Gray. Mr Morgan died in January, 1906, and his place was taken by Mr C. H. Winney (now Mayor of New Brighton). An amending Act constituted the Riccarton-Sockburn district in 1903 to construct the line to Riccarton, and Mr J. J. Dougall was elected by the new district. To-day the Board consists of Messrs G. T. Booth, A. W. Beaven, Dr. Thacker, and C. M. Gray (Christchurch-Sydenham-St. Albans), J. A. Flesher (New Brighton-Avon), Hon. J. Barr (Woolston, etc.), Herbert Pearce (Linwood), David Sykes (Riccarter-Spreydon-Halswell), and S. A. Staples (Riccarter-Sockburn).

In the interim Messrs Walter Hill and John Richardson have served on the Board, which, more than most local governing concerns, has had comparatively few changes of membership in its ten and a half years of existence. This, despite the fact that there have been contested elections on almost every occasion, and that the roll, which had 27,774 names on it at last election, is the largest in the Dominion. The qualification for enrolment on this roll (which include the wife or husband of the person qualified) extends to rate-payers, freehold or residential, the residential qualification requiring the payment of rent of not less than £10 per year.

"GETTING A MOVE ON."

The first Tramway Board didn't let the grass grow on its tracks. It was elected on January 21st, 1903. It met on the 29th, and elected Mr Reece, who has become known as the "Father" of the Christchurch system, first chairman, and Mr Wigram vice-chairman. At its next meeting, fourteen days later, Mr Frank Thompson was appointed secretary, and Mr Reece had secured by cable the services (as engineer) of Mr F. H. Chamberlain, a well-known expert who was on the eve of sailing from Sydney for America. With similar promptitude the conversion to electricity was taken in hand. To secure competition and local tenderers it was cut up into from fifteen to twenty sections, and a local concern, formed for the purpose, the New Zea-

land Electrical Construction Company, floated by the late Mr T. E. Taylor, secured all the contracts against outside competition. The contracting company had Messrs Geo. Bowron, J. L. Scott, Geo. Laurenson, and others in it, and they duly carried out the responsibilities they had undertaken.

PAYING THE PRICE.

While all this was going on, the price to be paid the existing companies was being settled by arbitration. Exhaustive evidence was tendered by the Board, Mr A. S. Biss, the Wellington accountant, being specially engaged. The result was that £40,359 was paid, including £18,738, paid by the public for the "goodwill" of its own creation granted in the form of concessions issued on its own behalf by its own public bodies—quite legitimately, of course. The rest was for the "going concerns"—decidedly "going" in some instances, and the rolling stock. Of the rolling stock then taken over, the old steam locomotives and the old trailers are still found useful work. Here is how the award was made up:—

	Award, etc. £	Goodwill. £
Christchurch Tram Co., Ltd. ..	23,910 10 0	12,729 10 0
New Brighton Tram Co., Ltd. ..	7,267 0 0	3,894 0 0
Christchurch City Council (Corporation Line) ..	1,200 0 0	—
City and Suburban Co. ..	7,981 19 3	2,115 1 4
	<hr/> £40,359 9 3	<hr/> £18,738 11 4

That may be taken as what the system stood for then, and I have already given the contrast between then and now in mileage. What the system stands for now, financially, may be gauged from the capital account. At the end of the first year of the Board's operation, March 31st, 1906, this account stood at £310,142. That represented what had been paid to the companies and what had been paid in conversion, construction, reconstruction, and for new rolling stock and plant. By the end of March 31st last this account stood at £647,368. That represents £9443 14s 2d for each mile of track, an expenditure of £7 17s 11d per head of the population.

FINANCING THE CHANGE.

The financial difficulty that had loomed large in many minds was got over all right. The first loan was for £250,000, all raised in New Zealand. That was rather a new policy then, but it was justified by getting the money at 4½ per cent. without any expendi-

ture beyond the advertisements and the printing of the debentures. The bulk of it came from Dunedin, Wellington, and Christchurch. This loan will be repayable on October 1st, 1934, and carries a $\frac{1}{2}$ per cent. sinking fund. All the subsequent loans were made to expire on the same date to facilitate consolidation if desired, and they all have sinking funds. Our tramway authorities are rather proud of the financial position of the Christchurch system. The Board recognises that it holds stewardship for the people of a rapidly wasting asset, one which is liable not only to depreciation, but even to supersession by some new traction invention, or some development of motor 'buses or the like, especially if local bodies are so unbusinesslike as to grant to rival concerns the privilege of running against the people's own transport firm, instead of keeping for the people the benefit of monopoly which the people alone should hold.

DOES IT PAY?

Apart from the liability of the trams to opposition and supersession, there is also the liability of the management to become suddenly involved in heavy unforeseen expenditure that was so strikingly illustrated in the Tramways Act Amendment, 1913. In view of all this the Board has wisely so arranged sinking funds, depreciation, and renewals fund, that the next generation will only have handed on to it such proportion of the debt as the depreciated asset would then be worth. There are not wanting those who argue that as the present generation carries certain liabilities without compensating advantages, bequeathed from the previous generation, the next generation should be similarly treated. Hang posterity! What has it done for us, anyhow? On the other hand, some of the best authorities maintain that the ideal of municipal management is to hand over to the next generation all municipal undertakings absolutely free of debt. The Board has wisely avoided these two extremes, and adopted a commendable middle course.

THE RESERVES.

At March 31st last, the depreciation reserve fund stood at £62,183, of which £12,124 had been added that year. The renewals fund at £55,886, the sinking fund at £17,702, so that after ten years' running, reserves amounting to £135,771 have been created, as against a loan liability of £551,200. It is a mistake to suppose that these reserves are all in liquid form. £68,045 of them have been invested in the undertaking in the purchase of new cars and

other improvements which are assisting to swell the revenue, and upon which interest is charged, and £64,099 has been invested in negotiable, interest-bearing securities. The indications are that the Board's extension policy has about reached its limit, and that for some years at least a greater portion of the reserves will be invested outside. In addition, a small fire reserve of £3730, and an accident reserve of £3823 has been created.

"CAPITAL" AND VALUES.

So far there has been a capital expenditure of £647,348, of which £49,896 was for "preliminary" expenses—the goodwill paid to the private companies, interest during construction, raising telegraph wires, and other expenditure of like nature antecedent to the date of operation. Revenue surpluses have enabled £32,812 to be written off the preliminary expenses account. As this is a valueless "asset," the wisdom of the proceeding will be apparent. If all the reserves and "writings off" are deducted from the original capital expenditure, the nett present "book" value of the undertaking is £504,023. Whether if offered for sale, "lock, stock and barrel," the undertaking would realise more or less than this is a point upon which probably experts will differ. Capitalists would naturally be chary in investing in a concern in New Zealand in which "Labour" expenses form so large a part. While the nett earnings last year amounted to the tidy sum of £54,532, or about 10 per cent. on the "book" value, the bugbear of a "wasting asset" would have to be faced. Private control would probably not be quite so liberal in fares and time-tables as the municipal body has proved to be, and a buyer would doubtless figure on securing a better financial return along these lines. While such speculation is interesting, it is futile to dwell on it, as there is no probability of the tramways in Christchurch being placed on the market to pass once again to private ownership. It is claimed that the Christchurch system will compare more than favourably with other New Zealand and Australasian systems, in which it is alleged provision for the future is inadequate. Summed up, the position appears to indicate that prudent finance has been a ruling factor in the administration branch of the People's Firm of "Christchurch Unlimited."

AN INTERESTING COMPARISON.

The figures show that only the most unremitting care could bring the

balance thus on the right side, and keep it there against future contingencies, and how this care is applied to the details of working is really the most interesting thing in connexion with our tramways. And there is one factor which the Christchurch management can point to with pardonable pride, and that is the position in which we stand in making comparison of the relations between operating expenses and receipts, a test of economy and efficiency in administration, and in general working right through the service. Here is how Christchurch stands in comparison with other systems as to the expenditure required to earn each £100 of revenue:—

Leeds, £52 2s 9d; Dunedin, £57 13s; Christchurch, £59 7s 9d; Auckland,

£60; Glasgow, £57 19s 7d; Bradford, £62 5s; Adelaide, £70 1s 5d; Wellington, £72 0s 7d; and Sydney, £89 12s 2d. The very honourable position which Christchurch holds is accentuated when local conditions are considered. Christchurch lines run through more sparsely populated suburbs than any of the other systems mentioned, and in no other city in the world are there so many bicycles in proportion to population. Christchurch is claimed to charge a lower average "concession fare" than any other New Zealand system. The wages paid here are much higher than in England, and a little higher than in Australia. Throughout New Zealand systems they are practically uniform. All these factors give weight to the comparison.

CHAPTER XXVII.

ABOUT TRAMWAY MEN.

There was for a time a good deal of foolish talk about "calling out the tramwaymen" in the trouble that arose in 1913. The Federation of Labour in its "general strike" madness called them out, but common-sense prevailed and none of them "came." In Auckland it was said that they intended to go out the moment the special constables came in to ensure the peace of the town and the unimpeded progress of industry upon which the very existence of the Dominion depends. Shortage of coal closed down the trams before the hour of test came, and with the "specials" on guard fresh supplies of coal saw the tramcars running. In Wellington some hot-heads in the service tried to bring their colleagues out, and certain of them brought disgrace upon themselves by obstructing lawfully-appointed guardians of the peace, and even discrediting their uniform by joining the roughs in stoning, or by using cars as battering-rams. Also, some of them tried to differentiate between passengers by endeavouring to insult or refuse to carry members of the special force that had saved the city from chaos, and protected every law-abiding citizen, tramwaymen included, from the mob violence of the "revolution." in the Courts. But in that regrettable convulsion no tramwaymen "came out." in the Courts. But in that regrettable convulsion no tramwaymen came out. And tramwaymen come under a special category, specially protected by legislation, and specially guarded against any betrayal of their trust to the public.

SAFEGUARDING THE COMMUNITY.

In the Industrial Conciliation and Arbitration Amendment of 1908 provision is made covering those engaged in the water, milk, gas, coal (sale or delivery), slaughtering of meat, electric light or power, working of ferries, tramways, or railways. If any employer in any of these concerns locked out his men without a fortnight's notice in writing, he would be liable to a penalty of not exceeding £500. If one of the men strikes without giving similar notice, he makes himself liable to a fine of £25. "Every person who incites, instigates, aids or abets any offence against this section, or who incites, instigates, or assists any person who has struck or locked out in breach of this section to continue to be a party to the strike or lockout" shall be liable, in the case of a worker to a fine not exceeding £25, and in the case of a union, or any other person other than a worker, of £500. It is quite right that all workers in public utilities should be so guarded, both from the consequences of any hasty and ill-considered action on their own part and from the intimidation and incitement of others.

The Christchurch tramwaymen, taken as a body, may be regarded as the finest body of tramwaymen in Australasia. There are individual exceptions, of course, but there are not many. Take them for all in all they are a smart, polite, competent and capable crew. They have had the good sense so far

to keep out of the Federation spider's web—they could not possibly subscribe to its doctrines and practices and be loyal to the public service that is entrusted to them.

How did the Christchurch tramways come to get so good a running staff, and where did they come from?

HOW MEN ARE ENGAGED.

To begin at the beginning, here is the system of engaging men: Applications are filed in the order of date. When men are wanted, some 15 or 20 applicants next in order are examined by the General and Traffic Managers, sitting as a Selection Committee, and those considered suitable are put down for the first vacancies. Confidential enquiries having been first sent out to former employers, and others to whom reference is given. A man thus selected becomes a "student," and is attached to an experienced conductor for training, till he is fitted to act as assistant conductor. His work is closely watched by inspectors, who also assist to train him. They form an opinion as to whether he will "make good" in the thorny path of tram conducting. After three months each officer who has been in contact with the recruit reports independently. If a proportion of the reports—say two out of five, are unfavourable, the Traffic Manager personally takes opportunities of watching the man's work unobserved. By the time he has passed all these he ought to be a paragon. The small percentage of accidents and the general civility and good attendance of the Christchurch staff are the result of this care and the simple but effective disciplinary system.

FOR HIGHER FLIGHTS.

Even when he is accepted on the permanent staff as conductor the training for the higher flights at the control key continues. Under the Act of 1910 no one can enter the sacred ranks of motormen without first serving a novitiate of at least twelve months as conductor. So you know that each of those calm, stern men who stand majestically apart from the common herd, preserved in a glass case, with the whole compartment to themselves no matter how crowded the rest of the car may be, and to whom you are warned that you must not speak, was once a familiar mortal to whom you could bid the time of day or ask where so-and-so of I-forget-the-name-street lived, for a mere penny fare. Finally, there is a Government examination for the certificate which makes them full-fledged motormen.

These drastic requirements often prevent the tramways from securing good motormen who have come here with experience in Australia or America or Britain, unless and until they go right through the routine like novices

WHERE THEY SPRANG FROM.

And where were these conductors and motormen drawn from? From every conceivable calling, apparently. Here are some of the previous callings of men in the Board's service:—Boilermaker, stationer and newsagent, confectioner, boot salesman, quarrymen, porter, railway guard, farm hand, labourer, carter, fruiterer, carrier, lighthouse-keeper, bar and cellarmen, fireman, fitter, draper, grocer, carrier, shunter, warehouseman, ranger, seaman, painter, constable, labourer-gardener, fitter-roadman-ranger, clerk-farm-hand-porter, carpenter-miner-labourer, tramwayman (England), chauffeur (England), moulder-packer-fitter, accountant, seaman-fire brigade man, bench hand, engine driver, bicycle agent, freezing works employee, soldier, jockey, waiter, letter carrier, electrician, stable foreman, compositor, flour miller, waiter, bus conductor, clicker, engine driver, buttons, baker, steward, foundryman, butcher, upholsterer, A.B., groom, tinsmith, saddler, ploughman, camp cook, plasterer, flax miller, beamsman, bricklayer, wharf labourer, boat-swain, printer, hotelkeeper, traction engine driver.

Of the above callings there are in many cases many representatives. For instance, there are quite a number of tram and railway men from Australia, Britain, America—and other systems in New Zealand. Quite a number of drivers of all kinds, of ex-business assistants. The staffing is cosmopolitan as to place of origin as well as to calling, but it has been welded into a particularly capable and particularly courteous and efficient whole, and if ever it was desired by the Tramway Board to establish a new republic it could obtain the materials from its own uniformed staff for nearly every calling required.

THE MATTER OF DISCIPLINE.

In the matter of discipline the Christchurch tramways first had the American "demerit" system, and though it had some objectionable features the officers' conclusion was that the general effect was all right. The chief objection was sentimental—to the merit and demerit marks. However, the men regarded it as inimical to their interests at that time, and it was modified, and a system of five grades instituted. At the end of each quarter each man's record is ascertained, and

the men with the best records—say the first half dozen—get a day added to the annual leave on full pay. So that in this way they can add four days in the year. The men at the bottom of the list have one day deducted.

MUST BE IN WRITING.

Though there is constant overlooking by the inspectors, no verbal reports are taken. Every statement has to be in writing, and with detail that will enable it to be enquired into if need be. The man criticised is given opportunity to make any legitimate defence he may have. An advice note is issued to the man reported on for any offence, and it will remain as a record against him unless removed on appeal. He has the right first of seeing the traffic manager, who may, if he is satisfied, cancel the record. If the traffic manager confirms it, and the man still regards it as unjust, he may go on to Mr Thompson, who will make independent investigation. If it still stands after this, the man may go on to the Tramways Board, and can appear before it supported by the secretary of his union and any witnesses he cares to call. And if the Board's decision is also adverse he has still a final appeal to the Tramways Appeal Board, set up under the 1910 Act, which consists at present of Mr H. W. Bishop, S.M., Mr J. A. Frostick, as representative of the Board, and motorman G. Lomas (son of the retiring secretary of the Labour Department), as the Union's representative.

"WELL FLETCHERISED."

The requirement that everything be in writing in the first instance, followed by such a process of mastication as would satisfy the Fletcherisers, should

make tramway men feel pretty safe from any possible injustice by a hasty tempered officer in the heat of the moment such as has brought industrial trouble and misunderstanding in other systems—and make him chary of listening to agitators and strike makers. The result is shown in the contrast between the smooth working of the human machine on the Christchurch trams, and the bumps and short circuits on such systems as Auckland and Brisbane. Yet at last general election some "grievances" were raked up, with a view to the "tramway vote," that the management had not previously heard of. So, when the election was over, the Board gave the Union opportunity of ventilating anything on its mind, and at a series of conferences the air was most effectually cleared of what had been, in several instances, misunderstanding.

THE MEN'S UNION.

The Christchurch Board has always recognised the men's union, which was formed shortly after the tramways were taken over, and the existence of this clearing house for any legitimate grievances has proved of mutual advantage. It is a safety valve. The Board is to construct a Social Hall for the men, which will also contain a room for the Union meetings, if so desired, and it is proposed to fit up a room for the union secretary, a smoke room, card room, tea room, lavatories, etc., all as comfortable as possible. Practically a club for the men, to whom, under the shift system, it should be of special value. It will include a technical library, and later other features in which the Board and its staffs can co-operate.



NEW BRIGHTON PIER—THE SURF BATHERS MECCA.

CHAPTER XXVIII.

THE USERS OF THE TRAMS.

The many-headed public is a strange entity with many strange ways and idiosyncracies. It displays special facets of its personality in each of its relations to the various services that minister to its comfort and convenience, from the persistence with which it will rush to do its shopping just when the shops are closing in the last moments of the late night, to the persistence with which the skirted section of it will always get off a tram the wrong way—and as often as not blame the conductor for the consequences.

THE WRONG TURNING.

It is a curious thing, this last trait, noticeable almost everywhere that trams are run. The Christchurch tramway management is thorough in its recording and treatment of accidents as in other respects, and looking over the records the most typical entry begins: "Lady alighted from moving car." It seems to be inherent in the sex to always alight the wrong way. Like the man who misplaces his "h's," and who appears to go out of his way and make an absolute effort to put them in or leave them out in the wrong place, you will see ladies who proudly proclaim themselves as of superior intelligence to mere man, and wronged because they are denied the premiership, or a place on the Bench, and who pass elaborate resolutions as to the righting of the universe, take elaborate pains to turn round and face the rear of the moving car instead of the way it is going before stepping off. You can see instances every day, and that peculiarity is the bane of the tram conductors' working hours everywhere—except only in Stockholm. There there were originally horse trams, which, to save the wear and tear of horseflesh in re-starting, used to merely slow down at street corners, instead of absolutely stopping. Consequently the fair Swedes had to learn to face the way the tram was going when they got off. Perhaps, though, it was the survival of the fittest. Those who didn't were buried at the expense of the tram authorities.

EVERY DAY ITS ACCIDENT.

In one recent month which I was looking up the records showed 31 actual accidents, of which 12 were from this foolish habit. The damage to the premature alighter ranged from "good shaking" to "ankle sprained," "head

cut—teeth broken." In the same month there were two collisions with motor-cars, and three motor-cycles collided with tram-cars, the riders in two of the cases suffering "internal injury" and "cuts" respectively. Horse vehicles backing into trams provided several accidents. There were such happenings to a trap, two butchers' carts, two ordinary drays, a timber dray, and a spring cart, with varying minor damage. Also a cart without lights, and a vehicle with an individual who had evidently been imbibing, collided with trams. Two conductors had accidents—one fell over a car step and hurt his leg, and another was struck by a trailer step and sustained a flesh wound.

GETTING AT THE FACTS.

The possibility of accident is always present in every traction system, but especially in systems running through crowded streets, and both for business reasons and in the interests of humanity a tramway system is particularly concerned to try and avert them, and to prevent its being taken undue advantage of on their account. No matter how trivial an accident may be, both the conductor and motorman have to report it. They have to get the names of as many witnesses as possible on the spot. That is imperative.

Here is a case in point. A man fell from a car and received a shaking, but when the conductor asked him his name he said, "It's all right, it was not your fault." The conductor, fortunately for himself, took the names of witnesses notwithstanding. Two days afterwards the man who had voluntarily absolved them from blame came and complained that the motorman and conductor were responsible for his fall, and demanded medical expenses and some compensation. When the testimony of the witnesses whose names had been taken was obtained, the liability was repudiated.

In another case a man went to headquarters and in bombastic fashion demanded immediate compensation for damage done by a car coming into contact with his horse. The report was at once turned up, and as a result the complainant was informed that it was he who had been to blame, and the Tramways wanted compensation from him for damage done to the rolling stock.

Such "accident claims" are constantly being received. Some people, apparently, if they prick their finger within a chain of a tramway line, write and claim compensation, and that is what makes the system of investigating everything with the semblance of an accident directly it occurs, and while it is fresh in witnesses' minds, of so much importance to the Board's finances as well as to officers who may or may not have shown contributory negligence.

Even in genuine cases some people appear to go on the principle of making a good big claim with a liberal "margin" for compromise, for when the matter comes to be investigated the amount assessed is often very considerably less than that first asked. One example—the claim settled while I happened to be at the Tramway head offices—was for £100. The settlement effected was £15 and £2 odd for costs.

DEFECTIVE MEMORIES.

One of the worries of the conductors is that there are people who will evade payment if they can. Possibly some of them forget that under the by-laws the responsibility of paying the fare rests with the passenger, and although the conductor is supposed to see that he gets the fare, the passenger is liable to prosecution if he does not pay when he has opportunity to do so, even if he has not been asked. That is a form of memory lapse that the management has been curing by a course of mnemonics before Mr Bishop. S.M., in certain particularly sad cases.

FOLK WHO LOOSE THINGS.

But the most remarkable of all the curious idiosyncrasies of the public in its relations to the tramways is its habit of leaving its belongings in the cars—and then blaming some one else for their loss. It is quite understandable that on a sea voyage, especially a rough sea voyage, there are people who will give up any thing, from their teeth to their immortal souls; who would give up the very boots from their feet—if they were not laced on. But this habit of parting with things is less understandable on a train, and very much less so on a brief tram journey. Again it is the fair sex that is the most forgetful, and the most prone to blame some one else for the result.

Elaborate precautions are taken to ensure that the people who leave their goods about in this careless fashion do not suffer more loss than is avoidable. First of all, it is the duty of the conductor, if he sees the article before some too acquisitive passenger does, to hand it on to the lost luggage department at headquarters. The check system

starts right away. The conductor is required to enter on his "journey way-bill" the nature and circumstances of the find, and the name of the officer to whom he hands the article. At the head office a list is made of these entries, in duplicate, and they are checked back, so that once that initial entry is made by the conductor it is hardly possible for the article to go astray. To each article a number is given, and for that number the officer in charge of lost luggage has to account, either by receipt from the owner on its being reclaimed or by its production for the annual sale.

IMAGINE IT!

For the year ending March 31st last there were over 1000 articles so handed in. Of those, 270 were ladies' umbrellas, 144 of them good ones, and there were 32 parasols—302 umbrellas and parasols left by the forgetful fair—and we may feel quite sure that in a great many cases the owners signalled the discovery of their loss by accusing someone else of stealing them. Against that 302, only two men's umbrellas were left, and neither were of much account, but possibly the 13 walking-sticks were mainly men's, though in these days of ladies' stick-carrying, that is not at all certain. Six ladies' coats, 8 woollen shawls, 14 muffs, 11 boas, makes another score of 33 to the ladies' tally, against only 13 men's and 11 boys' overcoats. But what about 4 pairs of trousers? How did their owners get home? It is not easy to solve the sex problem in regard to 142 bags and kits—but 23 string bags, 16 packets, 2 dress baskets, 6 Maori kits, and 76 peggy bags have a suspiciously feminine savour, and they account for 118 of the total. The 19 leather bags may or may not have been masculine.

WHAT OF THESE?

And what about the eiderdown quilt? The 3 white shirts, and 40 linen collars? The 22 pairs of goloshes? The new Methodist and Congregational hymn books? The 7 pairs of gold specs, and 5 pairs of humbler steel? The four bead necklaces—might have been pearl? The 111 purses? The 3 pairs of pyjamas (one of them with the continuations missing)? The new glue pot? All the keys—think of the heart-burnings when the lady accused hubby of mislaying the door-key? The music-stand and the music? The "brass curtain-rails"? The two tobacco pouches? The autograph book? The go-carts, the teeth, the hair? Only a few are obviously masculine. Note that only one man left his billy, only one man left his "new glue pot," only one man left the "ball-cock

for cistern." But the Boy Scout who left his "water-bottle and two signaling flags" can hardly have developed the "Scout memory" that Baden-Powell talks about.

HARD CASES.

Sometimes the people who lose these things are not contented merely to get them back—large numbers of them are never claimed, and are auctioned after being kept not less than six months in the lost property department. Take a recent case. A conductor found a peggy-bag in his car with about £1 in money. It was duly handed in to the office, and in due course recovered by its owner. She didn't leave anything for the conductor. Instead, she put in a claim on the Board for 4s "damage to bag while in the possession of the Tramways."

Of a different type was the occasion when a neat package, well wrapped in American cloth, and carefully strapped with rug straps, was found in a car and brought in. Presently a most subtly unpleasant odour began to pervade the office. The drains came under suspicion. The cleaners were questioned as to the thoroughness of their work. Disinfectants were used. Yet the odour grew. The staff began to sniff at each other disgustedly and suspiciously. Finally someone with a nose for locality arrived at the neat package. Investigation revealed the fact that the so-carefully-guarded contents were the refuse of somebody's table being carried home for the fowls. Since then no parcel can pass on its looks. They don't judge the package by its cover.

"I'LL REPORT YOU!"

The written complaints received from the public average about half a dozen a month, and, like everything else in connexion with the service, they are

carefully dealt with and tabulated. They include "failure to bring car to a standstill for passenger," "Impertinent to writer's wife," "Incivility," "Impertinence and side-bar down on wrong side," "Impertinence and passenger over-carried," "Not waiting to pick up passenger," "Failing to set down passengers at right destination," "Refusing to give name," "Wrong change," "Leaving terminus ahead of time," "Refusing to assist passengers with push-carts and children." Mostly, though, it is "Incivility." Each complaint is carefully enquired into, and where it is found to be justified punishment is made as far as possible to "fit the crime." A good many of the complaints are found "not justified." In others there is an entry on the employee's record, and such penalties as "three days on spare list," "fourteen days on spare list," "three days on broken shift and warned against repetition," indicate the result. "Spare list" does not refer to a shortening of the offender's diet, nor does "broken shift" betoken any mediæval torture. Evidently many complaints are made while annoyance is fresh, and as complainants cool down they become more considerate, for when the conductor's explanation is secured and sent to complainants with a request for further comment, nothing more is heard from them. Apropos of my investigations into these things, Mr Thompson pointed out that while it is desirable that passengers should complain when they have good grounds for complaint, it is equally desirable that the staff should be justly dealt with in such matters, and so an officer has been appointed to see personally the parties concerned and thoroughly sift complaints where the explanation given is not regarded by the complainant as satisfactory. And if this does not settle it there is the complete procedure that I narrated.



THE COLOMBO STREET TRAM ROUTE.

CHAPTER XXIX.

THE POWER BEHIND THE CARS.

You may get the most complete system of office management and of administration, and the most efficient "running staff" of the type that I have been describing as being organised in the Christchurch trams, but if the power fails, no trams can run. The management can manage, the traffic department scheme and devise intricate time-tables and shifts, the motormen and the conductors brush the last speck of dust off their uniforms and stand to their posts, the passengers get aboard, and pay their fares, but—if the "juice" is cut off, the whole contraption just stops. All the rest becomes futile. That is "The power (plant) behind the throne."

A MYSTERIOUS ENTITY.

What, then, is behind—this mysterious entity that the public never sees and rarely hears about, but without which the public wouldn't be shifted an inch on a tram car?

Well, in the Christchurch trams it is comprised in the department of Mr E. P. Turner, "Works Manager," and the sub-departments under him. And there is real living interest in every one of them to every citizen and every user of the trams.

Mr Turner was an apprentice of a good school, Scott Bros.' foundry, that has turned out many good men, after which he went to sea, and five years in the Blackball Coal Company's service. Then he joined the trams as second engineer at the powerhouse, and twelve months after the Board took over the system became engineer-in-chief, which position he held till his promotion to Works Manager in the middle of 1913. He has his first-class Board of Trade certificate, and is an Associate of the Institute of Electrical Engineers. The chief officers in his department are:—Mr C. Cowdery, permanent way engineer, with Mr B. Stocks as foreman. Mr J. A. Borthwick chief power-house engineer. Mr A. H. Thompson, car shed foreman, with Mr A. B. Chester as night foreman, Mr J. Malmanche overhead foreman, Mr W. Wason in charge of stores.

BACK TO FIRST CAUSES.

Back of everything is the power, and right back of the power is the coal, and that in the case of the Christchurch trams is the "Liverpool" coal from the State's No. 2 Point Elizabeth Mine—the new mine. The gentlemen

who are so fond of declaring that the State, i.e., the people, should control the sources of power in the coal supplies, and not the wicked private capitalist, demonstrated for sometime their determination to prevent so far as in them lies the State doing any mining, by shutting down the State Mines. Fortunately, the Christchurch tramways are managed by folk with forethought, and they have a big reserve stock on hand for "a Runanga holiday." The supply contract provides for the running of the coal trucks on the tramways siding and up a gantry, where they empty direct into the powerhouse bunkers, by electrical hoist. Which means in plain pence that the Board has reduced the cost of handling from 6d to 2½d per ton—a big thing when it is totted up.

WHAT THE COAL DOES.

This coal generates steam in five Babcock and Wilcox water tube boilers fitted with chain grate automatic stokers. They use 180 tons of coal per week—25 tons per ordinary day, and 35 on a public holiday—3.7lb of coal per K.W.H. (kilowatt hour)—if that makes you any wiser. During 1913 the powerhouse plant generated 4,564,926 K.W.H.'s, or units of electrical power, at a generating cost of .659d per unit. Including supervision, interest, sinking fund, depreciation, etc., the cost is 1.036d per unit, which is less than the rate the Dunedin trams pay the Waipori scheme. To produce each unit, 3.6lb of coal were burned, representing .337d.

WHAT THE STEAM DOES.

The steam that is thus generated by the sun-stored energy in the trees that grew before man was thought of, is taken direct to four Curtis steam turbines, three of which were supplied by the Australian General Electric Company from Schenectady Works. These are direct coupled, direct current generators of 500 kilowatts capacity each. The fourth is also of the same make, but it came though the National Electrical and Engineering Company of Dunedin, from their Rugby Works. It is a 1000 kilowatt alternating current machine, the current passing through a rotary converter to be changed to direct current. The Board was the first New Zealand tramway concern to introduce the steam-turbine-driven units, though the

Waihi Gold Mining Company introduced them before that into mining.

At the switch board the power is divided into a number of separate, independent sections. Should trouble arise any particular section can be cut out, so as not to interfere with the others. It is carried from the circuit breakers and switches per the overhead lines to the motors under the trams that watch the wheels go round, and then back again to the station by the rails.

NEW ZEALAND'S BIGGEST ACCUMULATOR.

The generators are supplemented by the largest accumulator plant in Australasia—with one exception—that of the Sydney City Lighting plant. It is a remarkable looking set of batteries filling a large, hall-like room, and it is used to deal with the 'peak load' which comes between 8 and 10, 12 and 2, and 5 and 8 p.m., when people are hurrying to and from their work or meals and rush the cars. By having this reserve power the cost of an additional generator is saved. While the loading is light, the generators are filling up the accumulators again from their surplus, through a "Pirani reversible booster." The accumulator consists of 280 big cells containing lead plates. One occasionally comes across very vague ideas as to what an accumulator does and what happens when it is "charged." The charging of an accumulator with power really consists in effecting a change in the chemical constitution of the battery elements. As the power is taken out again, the original chemical status is restored. Of the power that is put into these batteries, 80 per cent. can be taken out again. The other 20 is loss. Battery "commission." This particular battery is capable of giving the equivalent of 11,000 amps. for an hour. That would be approximately 700 horsepower to supplement the generators on the heavy loads, and as these "peak loads" are only reached perhaps for a few minutes at a time, it allows ample margin. When the weight of traffic goes momentarily beyond the power that the generators are putting forth, the accumulator just gives a vigorous "kick," and keeps the cars moving. The battery is generally completely discharged and recharged once in twenty-four hours. About half its charge is utilised in the morning, and the other half at the business rush hours in the late afternoon. Then through the night it is filled up again ready to help "kick" the business folk back to their tasks in the morning—and I have seen some of the juniors who look as if they wanted such propulsion.

ELECTRICAL TERMINOLOGY.

One often hears folk talking of electric power and its potentialities, but very few, outside the experts, understand its measurements, as they think they understand steam power. The power at the tram station is measured by watt metres. in Board of Trade units. These show the average output of the station to be from 14,000 to 16,000 units per day. A unit consists of 1000 watt hours, equal to 1 1-3rd horse power exercised for one hour, and 1000 watts make a kilowatt. Taking that as a basis, you can calculate for yourself what these things stand for in the terminology of steam and 'horse power.'

"THE JUICE."

After passing from the overhead lines to the car equipment, the electric fluid or "juice" as it is technically termed, passes through the wheels to the rails and back by them to the power station, and it is just here that a fruitful source of trouble used to be (and still is in some countries) developed. The electrical currents, if not properly confined to the rails will go running out to look for other congenial conductors, and so it used to find water mains and pipes and like adjuncts of civic convenience, and literally "chew them up" by electrolysis. There have been endless lawsuits and fueds between private companies and municipal authorities about this, but the New Zealand Government was wise in its generation, for it long ago made tramway managements responsible for their "juice" and made dire penalties if they spilled it about to the detriment of other people's property. They, in fact, provided for a compulsory audit of "juice" to see that none of it went amissing—just as is being proposed now with lawyers' trust accounts. So the tram rails are carefully gripped in copper "bonds" to ensure continuous "conductivity," and the Christchurch Tramway Board has to make a daily return showing that it has brought back from the terminal of each line the current it sent out, with not more than 7 volts drop in potential by the way, and the whole story is told on wonderful automatic recorders which go on day in and day out, putting down exactly the power that is generated, sent out, and brought back.

ABOUT BOOSTERS.

To ensure compliance with New Zealand's strict law on the subject there are what are called "negative boosters"—you know the sort of "positive" booster, that is so positive that you will make your fortune if you will only buy his suburban sections, or shares,

or cars, or what not. The tramways have their "positive" boosters, too—in the traffic and publicity departments—but the negative variety is modestly at work in the Power House. It is a generator connected to the rails to reduce "potential drop." So it has something in common with the two-legged "booster," after all. At midnight, when the power is taken off the lines, there is a test made for leakage—a test of insulation from the overhead lines "to earth," just to see whether a leak may have developed in the day's working.

The Power House staff that has to attend to all this is in charge of Mr J.

A. Borthwick, as chief engineer, and three other engineers, with four electricians, three greasers, six firemen, one battery attendant, and one yardman. Their work is arranged in three shifts of eight hours each, each man getting one day off in the week and one Sunday in four. Mr Borthwick has had both electrical and marine experience, and holds his marine chief engineer's certificate. All the assistant engineers are holders of the marine engineer's certificate. Mr Borthwick was for many years in the Shaw, Savill service, and after that in the Union Steam Ship Company.

CHAPTER XXX.

MAINLY ABOUT CARS.

The Carshed Department at the Tramway Board's depot has charge of the whole of the equipment, maintenance, and repairs of the cars, motors, and brake gear—everything that runs on the rails—during the time that they are at the depot. They become the charge of the Traffic Department directly they pass out of its wide portals. To carry out his responsibilities the carshed foreman (Mr H. Thompson) has under him a well-equipped repair shop, a day staff of 11 fitters, four blacksmiths, three coachbuilders, three painters, four electrical wire men, two pit men (who do the adjustment under the cars) and seven labourers. There is as well a night staff with a foreman, fitter, five pitmen, and 19 labourers—61 of a staff. The chief source of trouble so far as emergency repairs goes lies in collisions between trams and other vehicles, which I showed, in dealing with accidents, to be much more frequent than the public imagines.

WEAR AND TEAR.

But apart from these "extraordinary" calls there are the ordinary calls of maintenance. Every motorman has to report daily as to the condition of his equipment, whether there is anything wrong with it or not. These reports are first dealt with by the night foreman who attends to every deficiency within the power of his staff, and if more is needed withdraws the car from traffic and hands it over to the day foreman. The reports are passed on through the day foreman, with any notes called for, to the Works Manager, and then back to the shed foreman, who files them as a consecutive history of each particular car.

THE ROLLING STOCK.

When the Board took over the system it took over 55 trailers and eight steam engines, and added a big engine for construction work. It has since acquired 65 electric cars, and all have to be kept up to efficiency and safety. Of these, 22 were imported American cars by Stevenson, New York, with English (Peckham) trucks. All the rest of the cars are made by Boon and Co., of Christchurch, and trucks for 14 cars by Cooper and Duncan, the motors and electrical equipment being by the General Electric Company, of Schenectady, N.Y., and came through the National Electrical and Engineering Company, of Dunedin. Quite the latest thing in motors is being used in the Christchurch cars—two 50 h.p. motors on the Hill cars, two 40 h.p. on the large cars for the flats, and two 25's for the smaller cars.

GRACEFUL CARS.

One thing that always strikes the man who knows other systems is the gracefulness of the Christchurch car. See a car swinging down the curves of the Hackthorne road, for instance, glowing with light, and the suggestion is more of a clipper water craft than a tramcar. They are, moreover, a local product. The first lot of cars were imported from America. They are still in use. They are American "combination" cars—one "saloon" and two-thirds of the car open. Then there are three "double-deckers" that were imported. Since then the Board has had all its cars built locally, and quite a car-building industry has grown up in Christchurch in consequence. Other towns, like Invercargill, Wanganni, and Napier also get cars here. Mr

Scott-Symington, who had been with Mort's Dock and the New South Wales Government railways and tramways, was the first Operating-Engineer in the Board's service, and he designed the "double saloon" car with the "drop centre" and cross open seats. The drop centre was to get over the difficulty that faces all tramcar designers of avoiding too high a step, and yet allowing the necessary space for the motors. The "Boston elevated car" has got the centre part "suspended" with a low entrance, and they call it an "articulated" car. It gives ease in taking curves, yet permits a low step. They are "pay-as-you-enter" cars. The reason why that system cannot be adopted here is that Christchurch has sectional fares. In the States they have a universal fare. Once the passenger is inside, the conductor has no further concern with him till the end of the journey, but here he had to watch that he does not go over the section he has paid for without paying more.

WHY WE HAVE THE BEST.

Mr Wm. Reece is largely responsible for the high standard of the Christchurch cars. He had travelled widely and observed systems closely before he was elected to the Board, and he saw that Christchurch carried out the best ideas. Another advantage Christchurch has is that its 4ft 8½in gauge lets it have a car 8ft wide as against the 7ft 6in of Wellington and Auckland.

A CHRISTCHURCH INVENTION.

On many tram systems it is necessary to have different cars for fine or stormy weather. When it rains the people want a closed-in car to protect them from the elements, and when the storm ceases they want an open, airy car that they can look out of and enjoy the sunshine in. Christchurch has solved the problem of a car that is equally good both ways and convertible in a minute, yet is as neat one way as the other. It had its birth in a chat between the manager, Mr Thompson, and the late engineer, Mr W. Nelson, the idea coming from the roll-top desk, but it only became possible in practice after the centre aisle was forced on the various tramways by the Tramways Act, for the benefit of conductors, who had previously led a more or less precarious existence along an outside plank. The centre aisle has meant the sacrifice of seating, but in every other way it is advantageous. The new idea is the aluminium and glass shutter, which, in fine weather, is carried snugly out of sight in the roof of the car, and directly it is desired to close

in the whole or part of a car runs down in its grooves and makes a splendid closed in car at once. Mr Nelson developed and patented the idea in Christchurch, and it is now being adopted by other tram systems of the world. Already the working of the fitted cars has suggested further improvements, and these are being put into cars now under construction.

THE PROBLEM OF THE BRAKE.

The brake equipment is naturally of the greatest importance to tramcars in crowded streets and on the hills. The whole of the brake gear is made up in the Board's own engineering shop on the Westinghouse principle, the bulk of it is "straight air," but the Hill cars have an emergency brake as well. Under the straight air system, the air is pumped by motor out of the reservoir, where it is held at a pressure of 80lb to the square inch. From there it is delivered to the brake cylinder with a piston rod connecting the brake rigging which supplies the pressure to the brake blocks, and there is an automatic "refill switch" to enable the motorman to make four or five applications of the brakes without the pumps needing to start work again; but, when you hear that curious rattling under the car that sometimes puzzles folk who don't know, it is the air brake pumps at work renewing the pressure for your safety.

THE GUARD OF THE HILLS.

The consequences of a runaway on Hackthorne road may be imagined. The Christchurch tramways want to keep their remarkable record for immunity from such things, and so the Hills cars are doubly protected by an "emergency" brake which acts on the track, as well as the "straight air" brake which acts on the wheels. It is connected with an independent cylinder supplied by air stored in a separate reservoir to be only called upon in the moment of need. Any injury to the piping will automatically apply that brake. In Auckland there was a case in which a car struck a lorry and its brake equipment was so damaged in the collision that it ran down a hill into another car with fatal results. Had that been a Christchurch car the damage, instead of destroying brake power and life, would have immediately clapped four emergency brake blocks on to the track and pulled the car up standing. And to make assurance doubly sure that it will be always ready when the call comes, each motorman has to use his emergency at the beginning and end of each shift, while coming down the Hill, and in his daily

report he has to answer the questions as to having so tested the "emergency" and the result.

NEVER CEASING VIGILANCE.

It is this system of constant watchfulness over all brakes that keeps down the death rate. Not only is there the unremitting attention while the car is out and after it comes in, but in case of collision a car has to be sent to the depot, and there the engineer in charge immediately tests to ascertain the condition of the brakes at the time of the accident, before any alterations or adjustments are permitted. In fact, there is far more trouble taken to teach men how to stop a car than how to start it. In the case of the emergency brake it is so arranged that it can be applied by the conductor or any passenger by pulling the cord which runs the length of the car along the top, as well as by the motorman—I wouldn't advise you to try it, however, when the car is going—except, of course, if there was a runaway, and the guard was incapacitated. That is, if you have any respect for any loose teeth you may have about you, apart altogether from the subsequent visit to the Bishop-Bailey-Day combination. And then, as I said, Christchurch has so far never had a runaway—one of the few systems that can say so truthfully.

THOSE "COW-CATCHERS."

Another safeguard to the public is the wheel guards and trip gates. Whatever has been said of certain American juggernaut systems to the contrary, no careful tram management really likes to have human fragments mixed up in its car under gear and wheels. The tram man is supernaturally tidy—you see that in his uniform, his cars, at the head office, in the spotless glistening power house, and his tidy soul revolts against the mess made by dessicated citizen—apart altogether from the amazing realisation of the monetary preciousness of the dear departed, which the relatives suddenly discover. So tramway engineers are constantly endeavouring to improve on the queer contraptions which you see in front of the cars for the gathering up of the citizen who will lie on the rails. There is a story of a Premier in another State who was said to owe his subsequent eminence to an experience with a cow-catcher—it made a teetotaller of him. But the tramway management's primary object is not reform (though it doesn't allow drunks either on, or under, its cars), but prevention. So it fits a steel arrangement with cushioned springs to pick the citizen up. The motorman controls this

by his foot, but an automatic apparatus is being tried on some of the cars so that if the motorman failed to see, or hesitated to toss up some citizen to whom he had perhaps not been introduced, the stranger would first come against a swinging gate, and that would release a pawl, which would instantaneously bring down a "cow catcher" in front of the wheels.

"BUCKLEY'S CHANCE."

But if, in spite of all this, the determined citizen still persisted in getting under the wheels—from some other point of view, so to speak—cars are, in the future, to carry jacks. The type of jack to be used is "Buckley's Jack," which is in use in New South Wales. It will lift a car 8 inches in two minutes—and that is "Buckley's chance" for the citizen who has "gone under." There was a very sad case at Auckland recently where a child was held under, crushed and in torture. It hadn't even "Buckley's" chance.

THE WHEELS.

Another feature of cars that has to have very watchful care is the wheels and axles. You see on the railways how men go along and tap the wheels with a hammer at the stations to see if they ring true, and if there is the slightest suspicion of trouble off comes the carriage. There isn't the same strain on the tram axle and wheel as in those of the train, but it is still great. Once the Christchurch trams used to average a broken axle a month. The equipment they have been acquiring since is better. Their axles are now of Siemens-Martin acid steel, titanium treated, and the axles give little trouble. The car-shed staff shrinks on its own centres steel tyres, which are mainly from John Baker, of Hadfield, but Bessemer, Krupp, and Midvale (New York), steel tyres are also running on Christchurch rails. Some of the driver tyres have run 200,000 miles—they are the thicker—and the life of pony tyres is from 60,000 to 80,000 miles. In the course of this running they naturally wear down so that the putting on of a new set raises a car $2\frac{1}{2}$ inches, which is one of the factors in connexion with the height of step question. When the tyre is down again to a thickness of $\frac{3}{4}$ of an inch it is taken off.

After each car has travelled 6000 miles it is "docked" for complete overhaul. The car runs an average of 130 miles a day, and it used to be necessary to bring it in after 4000 miles, but improved methods have added another fifty per cent. to that running period. In this "big" over-

haul every part is subjected to rigid tests, and renewed where needed. The American system is to run the car without this docking, as long as it will run, substituting rigid inspection for the overhaul.

"THE OVERHEADS."

There remain three sub-departments under the works manager's control. The Overhead Department is responsible for the erection, maintenance, and inspection of all overhead lines, telephone lines, and the day and night "breakdown" emergency crews. It is staffed with foreman, leading lineman, five assistant linemen, and three drivers. When a new line has to be constructed, as in the case of St. Martin's at present, only the "ground work," so to speak—the permanent way—is let by contract. The contractors in the St. Martin's case being Brightling and Marriott, who start within a week, having been held up by the non-arrival of rails. The erection of the posts and their equipment of wires and

the rest is done by the Overhead Department itself.

PERMANENT WAY.

The Permanent Way Department has its engineer (Mr Cowdery) foreman, three leading hands in charge of maintenance gang, construction gang, and shed gang (which mixes tar, metal, and so on), and its drafting staff. The outdoor gangs consist of platelayers and labourers. They chiefly deal with permanent way repairs needed through heavy vehicular traffic or wash-outs, and "track repairs," which consist of lifting, levelling, and "packing." The most troublesome bit of track to deal with is Opawa, where 40 heavily-loaded drays from the quarries have been counted in one hour, all using the track the Board made for its trams. The Track Engineer has to prepare plans and surveys for new tracks and alterations in existing ones, and supervise contract construction, while the permanent way foreman sees to the labour that is to carry it out.



ON SUMNER BEACH—A FAVOURITE TRAM TRIP.

CHAPTER XXXI.

THE RUNNING OF THE TRAMS.

I have now written of every department excepting only the two most important ones—the head office under the general manager and secretary, Mr F. Thompson, keeping tab of all the rest, and the traffic branch controlled by Mr H. A. de Courcy Browne, traffic manager.

A COMPREHENSIVE OFFICE.

The Traffic Department is that with which the public is brought constantly into contact. From the moment a car leaves the sheds till it re-enters them, it is under the control of the traffic manager, its every movement and every act of its crew are his concern. The functions of his department are the ultimate fruition and consummation of the efforts of all the rest, and he acts, moreover, as a buffer between the public, the employees and the employers, the public which wants all that it can get for its pence, the management which wants to see a margin from the public's coppers, and the employees who want to get as good a share of them as they can, and as good conditions as are possible in the earning of them. It is in the fulfilment of these often divergent calls and conditions that the science of traffic management lies.

THE SCIENCE OF IT.

And that it is a science the enquirer is soon convinced. To the men who grumble because, having poured out to Brighton or the races all day long, and waited for the last town tram or the dividend on the last race, they find that the out-going traffic of six hours, cannot be brought back in six minutes; to the man who "always walks when it is fine," and is incensed because he cannot get a seat in the midst of hundreds more like him when the sudden thunderstorm comes on in the "rush" hour; to the other man who cannot understand why there should be any difficulty about putting on the special car he wants for the Sunday School picnic at the precise minute he desires, and at almost momentary notice—to any or all of these the Traffic Department is a Monumental Mass of Blithering Incompetence requiring his own all discerning intelligence, and firm hand to "put it in its place."

TINNED TABLES.

Perhaps? But let these irate persons have the run of the pigeon holes in

the traffic manager's room. Let them draw out tin canister after canister, and extract the charts upon which the whole traffic system is based, and see the circulars of instruction to the running staffs, and they will begin to dimly realise that there is more in the running of a tramway system than ever entered into their philosophy. They may even possibly conclude that they are more at home with the yard stick, or the steel pen, or the long-handled shovel, or whatever may be their particular specialty, than they would be in the running of even this little bit of the universe that they had been hitherto prepared to re-constitute in a fraction of the luncheon hour.

FROM THE BEGINNING.

Before an Order-in-Council is obtained authorising the construction of a tram-line the Traffic Department has to report on the number and positions of loops, and take into consideration the speed, running time, number of cars to be operated, and service to be given. Before the opening of the line a time-table has to be prepared, and a number of factors have to be considered. The common-places of life are the complications of the traffic manager, and one can quite conceive one of the genus agreeing with the "problem story" writer that there is no such thing as "The Simple Life." Life is a maze of complexities. The traffic expert has to review the whole life of the community in its habits morning, noon, and night. Its out-goings and its incomings, its virtues, and its vices, its sorrow and its joy. How its holidays and festivities will modify or intensify its tendencies. How they will be affected by the passion or the fashion of the hour, and the weather of the moment, theatres, picture shows, races, galas, church services, football matches, even work. He has to devise connexions with railway trains—with other tramway lines. Where two or more services use the same street, he has to so split the services as to give the maximum frequency over the joint line. And to work it out he first plots it on portentous and mysterious looking diagrams on which the starting and finishing points and the intermediate crossings and loops are shown by horizontal lines. The tram trips are drawn across them in diagonal lines, and all along the top are the hours and minutes. It is more involved and crazy-looking than a horoscope.

A COMPLEX CONCERN.

You have seen the weather charts with the wavy lines wobbling all over the place when the nor'-westers and the sou'-westers, and the rest of that "push of meteorological larrikins" get to grips; the temperature charts in a hospital; the earthquake records at the observatory. The traffic diagram has something of all of these. It is from eight to nine feet long, and there is a separate one for each week day service on each line, another for each Friday night service, and each Sunday service. That is, three ordinary diagrams for each route. And then there are the holiday diagrams. On these every loop, every crossing, every stopping place is marked, and the tram services are marked in lines which bisect the whole. The most complicated are the Cashel street and Worcester street single lines, through which the Burwood cars come in one way and out another, and there are a number of crossings to negotiate, and cars to pass. Lines of red and blue, yellow and green, cross and re-cross each other till it looks to be the sort of nightmare Unionist orators declare will follow Home Rule, or a fierce world's championship at the ancient

and honourable game of "noughts and crosses." Any alteration to a Burwood or Linwood car which exceeds the standing time at the Square involves the Brighton, Addington, Burwood, North Beach, and Richmond cars, and their several loops and crossings. In fact, the services on single line routes are all inter-dependent, and an ill-considered alteration to one may set the rest out of gear. As it is, the diagram provides for safe and orderly transit, and from it the traffic department can see at a glance where any one of all its cars is at any time of the day or night.

THE TIME-TABLES.

When such a diagram is completed to the satisfaction of the manager, the working time-table is taken from it. That now in use in Christchurch shows the motorman the exact time he is to make every stage of his journeys, including the crossing loops, positions of "side rails" and "gates" at the different stages, etc. From this the public time-table is made out, and the "yellow slips" that are stuck up at each stopping place, and that involves, whenever an alteration in running is made, quite a lot of work in readjusting.



TRAMWAY SHELTER STATION IN CATHEDRAL SQUARE THE CENTRAL POINT OF THE SYSTEM.

CHAPTER XXXII.

SHARING THE WORK.

Having dealt with the convenience of the public the traffic department has to enter upon its most difficult problem—how to apportion the work amongst its staffs as to secure efficiency, economy, fair dealing, and consonance with the award. The making out of the “duty roster,” when the whole service has to be revised, takes weeks. The men are paid by the hour, but the permanent men have to receive eight hours work or eight hours pay under the award, even though they only worked one, and the eight hours have to be within a given twelve. Thus a man might, say, be on the cars from 8 to 9 a.m. and not be required again till after 8 p.m., but he would have to be paid for his eight hours all the same, and if he were put on for another hour from 8 to 9 p.m., that would have to be paid as overtime. There is a “spare list,” chiefly consisting of juniors and new recruits through which the men graduate, and, according to a decision of Mr Justice Sim, in Auckland, the employer is not compelled to observe the award conditions in regard to “spares” or give them any work at all, but the Christchurch Board does not want to avail itself of this, and instructs that its “spare list” men shall be just as carefully considered in the apportionment of duties as the men it has to pay whether it finds work for them to do or not. Only there is this advantage with the spares, that the twelve hour rule need not apply in their case.

THE BUSINESS PROPOSITION.

A moment's thought will make clear to the business man how essential is the elasticity of a “spares list” to economy and efficiency in a business like tram running, and how much depends on the successful utilisation of as much as possible of the time paid for. That is expert work. There are the extra cars to be provided in business rush hours and wet weather, time after nine hours to be paid for at overtime rates, “stand-by” or idle time to be reduced to a minimum, extra cars for Friday nights, and after theatres, etc., assistant conductors to be provided on “trailer” trips, and many other details of like nature. The greater the number of extra cars required in rush hours and wet weather the more the time of the men necessarily becomes broken and the more the men complain. Each man has also to get his fair share of Sun-

day work, not too much and not too little. When the time-tables and the duty rosters are finally complete and the cars start running to them, daily provision has to be made to fill the places of men absent through sickness, holiday leave, etc. Extra work, such as picnic and ball specials, has to be arranged for very often at short notice, and always in keeping with the terms of the award. When such special cars are run, the car crews are given the details of their running, showing places and times of crossings with other cars. To meet the ever varying conditions, a seemingly complex, but in working, exceedingly simple, method is adopted of numbering every man and every duty. The duty rosters have each duty numbered for the whole of the men. If one man is sick or on leave, his substitute receives intimation that he takes up duties of No. so and so, and going to the elaborate duty roster, that is always posted in its case, can tell at a glance every detail of the duty he is to take up. Besides these duty rosters there is a “weekly notice,” issued each Friday to each man, which gives men instruction on whatever point is necessary; gives minor time-table alterations, repeats rules from the rule book which are not being carried out, gives special instructions regarding race meetings, fares, etc. This is the medium by which information is imparted to employees, and it has the advantage of being always on record. Similarly, when each man starts in the service a file is opened in his name, and in it is placed all correspondence relating to him of any nature, whether reports for or against, complaints, commendatory advices, etc.

THE TRAFFIC STAFF.

It will be seen that the Traffic Department in the duties herein enumerated has a very full hand, but there are many other duties. The mileages run by each car and power consumed by all vehicles is recorded daily under the card system. Each day each motor-man hands in his “journey way-bill” and its contents are tabulated on to the cards. The staff in the traffic office consists of Mr De Courcy Browne, who graduated from the big Sydney system—which is one of the largest in the world under one man-

agement. The Sydney traffic department is managed by a New Zealander (Mr Kneeshaw) who graduated on our railways. The office staff consists of Mr Alexander (traffic clerk), a junior clerk who files the men's records, and a mileage clerk. Outside there are two Traffic Inspectors, five Ticket Inspectors, one Motor Inspector, and at the sheds two Despatchers, and two Assistant-Despatchers. Then the running staff consists of 82 motormen and 93 conductors, about twenty of whom are on the "spares" list.

WHAT THE INSPECTORS DO.

The Traffic Inspectors are in charge of Cathedral square. One is always on duty, supervising the running, providing for the maintenance of services in the event of disruption, watching the loading in and out so as to provide sufficient accommodation, by extra cars, trailers and otherwise, from the depot in town. There are 24 trailers in reserve there, and you can see them being taken in and out as needed by the old steam engines. On some days every one of the old horse cars and old steam cars that were taken over with the system have to be requisitioned, and the way they will sidle coyly out to take their places when the blue sky is broken by storm, as though they were just a little shy at being (like last week's hats) out of date, yet conscious of duty well done—is one of the interesting minor sights of the Square. They dance to the Traffic Inspectors' piping as well as the latest electrically fitted debutant.

A DRESSY LOT.

The Traffic Inspectors also keep a wary eye on conductors and motormen, and help to keep up the standard of spic and spanness in which the Christchurch system is some points ahead of any other tram service in Australasia. In part this is attributed to the fact that the men are required to pay a fourth of the cost of their uniforms, and so take care of them. Perhaps it is also due to the good "prime Canterbury" wool and the good work the Kaiapoi mills put into the cloth, but it is a very rare thing to see a Christchurch tramway man who does not seem particularly well clad and well groomed. Curiously enough, another transport branch in Christchurch is not in many instances as well turned out as the same class elsewhere—the corps of chauffeurs. Many are natty, and most of their cars, but quite a number of the Christchurch chauffeurs are unshaven and frowsy, and quite fail to live up to the smartness which was tradi-

tional with the Christchurch cabs and cabbies, before petrol eclipsed the one-time glory of Christchurch cabs and cab horses that were regarded as the finest in the Dominion.

THE TICKET INSPECTORS.

The Ticket Inspectors' duties are obvious. They protect intact the revenue that must reach the cashier if the public ownership of its service is to continue, and they protect the honest conductor and help him detect the dishonest passenger who professes to forget that there is legal as well as moral obligation on him to pay his fare whether the conductor overlooks him or not, a position demonstrated the other day in the Courts. The Motor Inspector's duties are also obvious, and he effects temporary repairs on the roads, and keeps an eye on equipment, mechanical and human. One of the main reasons for his appointment was the prevalence of "flat" wheels. The development of a "flat" on a wheel means noisy running and unnecessary damage to the wheels if it is allowed to go on, which will necessitate expensive treatment that might be obviated by the proverbial stitch in time.

The Despatchers are an innovation of the present Traffic Manager, concerned with the signing of the men on and off duty, and the time clocks, and with seeing that they have their right equipment and their right trip. They have other useful functions in the general economy of the system.

MAKING THE MOST OF IT.

I have already shown how the Traffic Department has to make the most of its men. Another interesting problem is making the most of the cars. It has 65 electric cars, 73 trailers, and eight steam locos. to play with. That figures out at 138 passenger cars. On, say, an Easter Monday, 40 cars are required for the ordinary time-table services. That leaves 98 cars of all kinds available for other work. There have to be shifted to the races, say, 80 car loads, to Sumner 120, to Brighton 120, to the Hills 40, to North Beach 30. That is, some 400 car loads to be conveyed to all points of the compass at much the same times with 98 cars. Even The Man in the Street will see that there may be some points in running trams. Last "National" week 544 car loads were conveyed to the races. Last Carnival Week, 508,019 passengers were carried for £6033, and on the People's Day at the Show, 413 car loads were carried to and from the Show and trots. Surely Christchurch folk are a race of tram riders in spite of their pre-eminence as bike riders!

CHAPTER XXXIII.

THE HEAD.

All the departments of the tramway system have now been specifically dealt with except the head of all, and as that has incidentally permeated all the rest, there is no need to deal with it at any length, though in various phases it might be so treated quite interestingly. There are, for instance, the mechanical aids in the accountancy branch under Mr H. E. Jarman, the extraordinarily complete system of checks and returns in a business that peculiarly calls for checks, and where the leaking pennies would, if possible leaks were not stopped in advance, speedily bring disaster. There is the ingenious system by which each conductor as he comes in at any hour of the day or night, opens with a lever a port-hole in what is a strong-room wall, and inserts in it the cash-box which covers his day's work and contains all the factors necessary for checking it, and one box instantly vanishes in such a fashion that it cannot by any possible means be got at from the outside, while the next empty division automatically adjusts itself to the port-hole for the next box and man. There is the cashier system, the 'Typistes' Department, with a 'Records' system that enables every imaginable kind of information of value in administration to be available at a moment's notice whenever called for. Then there is the way in which every administrative wire connects up with the roll-top desk of the manager-secretary, Mr Frank Thompson, while still allowing for the requisite responsibility of each departmental head. That, in fact, is the impression that most markedly remains after being through it all, the impression of complete organisation, of a smooth-running machine from track-cleaners right up through the management to the Board itself. This is what enables the system to carry that astounding number of 16,060,441 passengers (in a population of 82,000), 2,125,566 miles per year at a total cost of 1.978d per passenger, on a profit margin of 89-100th part of a penny per passenger, which shows how little there is to go and come on. That margin is possible because there is unceasing vigilance, and a key-note of efficiency right through, and because everyone seems to take a special pride in his share in achieving it.

A COMPLETE SYSTEM.

To bring about such results a most

complete system of organisation has been evolved. It begins with a daily report from the track cleaners on the condition in which they find the 60 miles of track as they plod along it in the early morning, and it covers every appreciable element in the plant, and every phase of the working. It is the "stitch in time" worked out to a fine point. There is a diagram in the general manager's room which illustrates the system at a glance, but which is less easy to describe. Take the Traffic Department. The 82 motor-men and 93 conductors are connected through the inspectors and the traffic clerk with the traffic manager, to whom also the "mileage clerk" looks, and the traffic manager connects with the general manager. In the Works Department, the labourers work under the leading hands to the permanent way foreman. The cleaners to the same foreman, the foreman to the track engineer, and he to the works manager. The coal heavers in the power house, and the electricians, connect with the works manager through the power engineer; the linemen through the overhead foreman; the shed hands through the night-shed foreman to the carshed foreman; the fitters, recorders, and storeman also to the carshed foreman; he to the manager, again concentrating at the general manager's desk. The store and record men, the stores clerks, timekeeper, ticket clerks, etc., all work through the accountant to the general manager, and he to the Board.

UP TO THE BOARD.

Thus every wire in the 350 live wires of the staff concentrates through the executive head to the elect of the people constituting the Tramway Board, and that controlling body is furnished with information so complete that it can review every phase of the operations. At the end of every four weeks the general manager submits to it a profit and loss account, such as a joint stock company usually submits only at the end of every half-year or year. Every item of expenses is compared with like items of previous terms, and where they show increase the manager is in a position to explain just how that increase has come about.

He has recently adopted the practice of sending their profit and loss statements to the various foremen as well as

to the two other chief executive officers. Each of these is consequently induced to take the keenest interest in his contribution to the result, and watches the ever fluctuating tell-tale "mileage cost" column with as much interest as the crowd watches the flickering of an election barometer on election night. "Economy, and still more economy," is the watchword, and while the Board requires from the manager adequate explanations of increases, it is not slow to congratulate the staff when the costs drop, and that was the pleasurable experience several times last year.

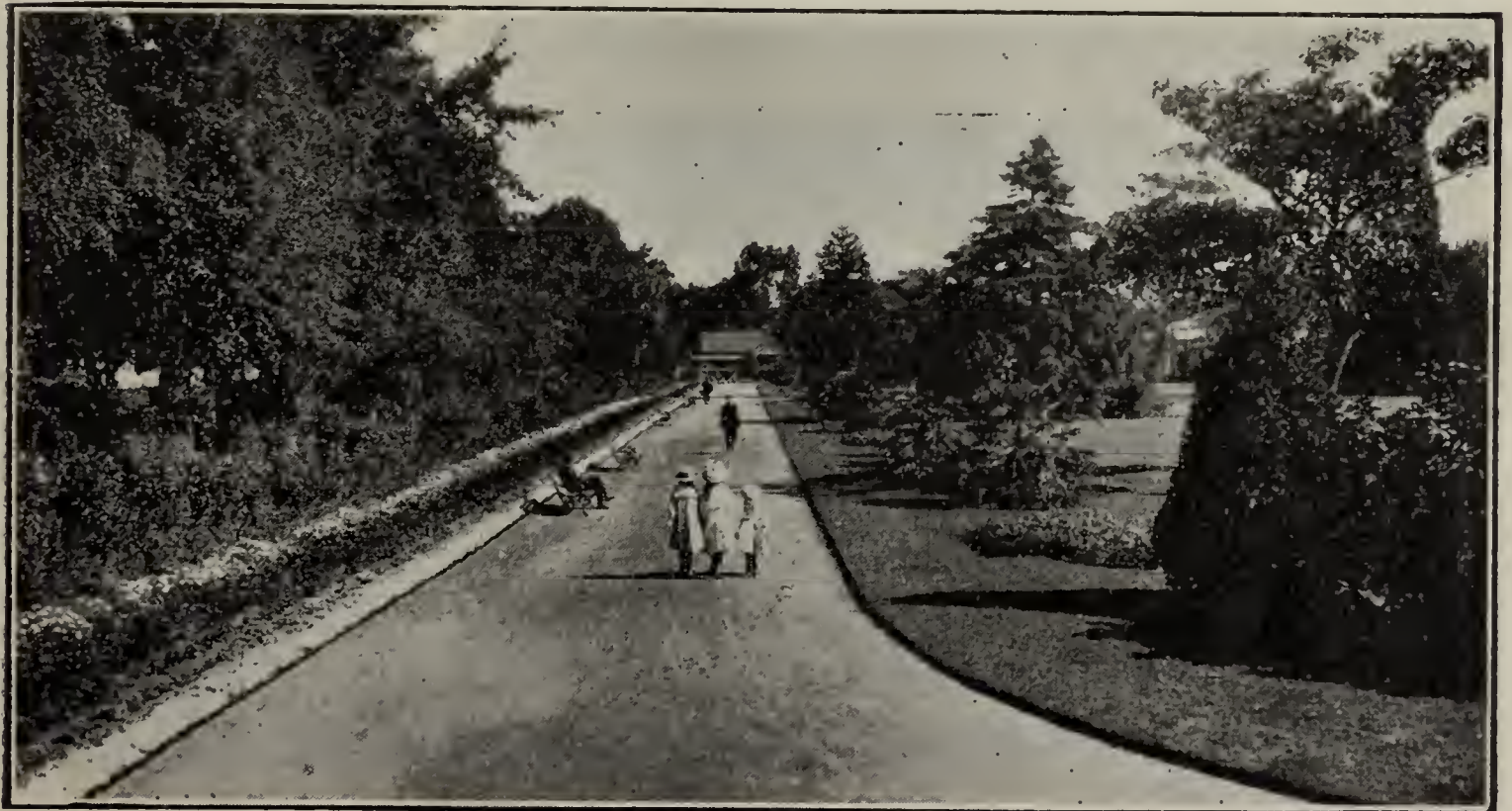
WHERE THE PENNIES ARE.

It is when you go into all these matters that you see where and how the Christchurch trams manage to keep the financial pot boiling, in spite of the empty, or nearly empty, cars seen on some lines at times. Lines like Papanui and Cashmere Hills are the backbone of the system, and the harvest that is reaped from the Hills and the seaside in the summer, supplements the hauls of Carnival Week and National Week (the envy of every other tram manager in New Zealand), when the city is full of visitors, dropping their pennies in the tramway slot. Personally, I think the Hills have their greatest charm in winter when the sunshine bathes them while the flats may be in mist and fog, and that a sunny beach and a breath of ozone from a breaker on a frosty morning is a greater relief than a scorching beach and driven sand in a hot nor'-wester. But the public does not think so, and so the revenue of these lines flops dismally when winter approaches. When the sun comes round with its summer intensity, it booms up at once

to fill the coffers of the Citizens' Transit Branch. Occasionally the patrons of the more profitable lines are heard demanding increased facilities quite unmindful of the weaker members of the family. While the traffic returns of each line are published, the profit and loss account of each line is also prepared periodically, but it is used "in committee" only. Presumably, the Board feels that its scriptural policy of the strong bearing the infirmities of the weak would be subject to an attack too strong to resist, if all its cards were laid on the table.

NO "GRAFT" IN SIGHT.

There is just one further word I would like to say before leaving the subject. That is, that in the course of a fair amount of delving into the affairs of the municipal firm, I have not seen evidences of the municipal "graft" that so afflicts some big centres. I have seen opportunities for it, but have not seen that they have been availed of, and Christchurch is to be heartily congratulated on the cleanness of its municipal administration. Take the trams that I have just dealt with. They purchase very largely, and their custom is very valuable. In ten years, Mr Thompson assures me he has only seen two cases of attempted "graft." The engineer was once so approached by a firm that wanted to "get in" with a certain line that he felt constrained to show them the door. On the second occasion, the general manager received a very valuable watch through the post that went so palpably beyond the limits of the "Christmas greeting" that he returned it. In neither case was a Christchurch firm concerned.



IN THE BOTANICAL GARDENS.

A GREAT FIRE APPLIANCE FIRM.

In dealing with the outfit at the Christchurch Fire Brigade's splendid headquarters, I had occasion to refer to Mr. Simonis and his gear. The flying visit of Mr. Simonis has left its track in improved appliances throughout the fire stations of Australasia, and if we take in the world that is supplied by Henry Simonis and Co. from their Pretoria Works, Walthamstow, London, N.E., the amount of property saved by the improvements they have effected in the tools at the hand of the scientific fire-fighter, and the number of lives saved by their extraordinarily ingenious fire escapes, would rank Simonis as a sort of reversed Napoleon—a saver, instead of a destroyer, of millions. In New Zealand, the house is represented by the Kemsley and Co. Proprietary Ltd., of 90 Lichfield Street, Christchurch. I was shown there many letters from experts as to Simonis' gear in the Dominion. Superintendent Warner had already spoken highly of Christchurch's share, and the Palmerston North motor pump and escape I had personal knowledge of, likewise the wonderful Auckland escape ladders shown here. One of the letters was from Superintendent W. H. Barnard, of the Palmerston North Fire Brigade, who wrote of the motor pump and escape pictured here. "I am more than satisfied with her. She works wonderfully well and safe. I have had her pumping frequently as much as 200lbs. pressure. The famous Pretoria ladders are easily worked, and combine strength lightness and simplicity"—and much more in the same gratified key. And so with all other users. Here is a brief list in New Zealand, constantly being added to.



SIMONIS' ELECTRIC FIRE ESCAPE—AUCKLAND—In use over 12 months. DUNEDIN - Ordered. WELLINGTON AND CHRISTCHURCH—Under offer. PALMERSTON NORTH—Simonis' Combination 50-H.P. Fire-Fighting Machine, including a 350-gallon pump, and 45ft. Pretoria ladder. GISBORNE—Simonis' Combination 40-H.P. Chemical Engine and 35ft. ladder. MOUNT EDEN FIRE BRIGADE—50-H.P. Fire Tender, to carry 10 men, 3,000 feet of hose, and 35ft. ladder.

The Simonis' firm also gives special attention to the manufacture of every conceivable Fire and Ambulance Appliance, and Mining Rescue equipment. Their patent Smoke Helmet is a simple contrivance, which enables a man to enter any chamber or room which may be impregnated with smoke or noxious fumes, such as would arise from escaping ammonia, etc., and rescue life or repair broken pipes, etc. It has a big record of life saved already. The Christchurch Meat Co., Farmers Co-op., and other large establishments throughout the Dominion, have them in use.

Messrs. Simonis are also the pioneers in the manufacture of Electric Traction as applied to street watering and dust-removing appliances. Our corporations are making enquiries into the question of adopting these remarkable labour-saving machines.



The
Christchurch Fire Board
and its
Up-to-date Central Station.

CHAPTER XXXIV.

FIREMEN OF THE PAST.

THE FIRE SERVICE.

There is a fourth factor in the municipal hegemony of Christchurch that will round off this particular set of articles. That is the Fire Board. Christchurch happens to be peculiarly fortunate in its fire service. It has an exceptionally efficient water supply, as I pointed out in dealing with that branch of the city firm's activities. The high pressure supply of 106lb to the square inch is more efficient than any of the other centres except that of Wellington, where there are larger mains than here. The automatic fire alarm system has proved its efficiency. It has the best fire station in the Dominion, and a smart brigade maintained by the rates and the insurance companies. In fact, the only complaint I have with it is that it is too beastly efficient, and, from the "fire bug's" point of view, officious. Within the area to which its activities are confined, fires are given no chance to become spectacular. The picturesque adventure that was once associated with the ringing of the firebell is gone. They don't even ring a city firebell. It is all done by those silent, uncanny, ingenious automatic alarms, and the first the public outside the persons directly concerned, or who "happen to be there," know that there was a fire, is the paragraph in the paper announcing "a good save." All the old-time excitement is gone—the clanging, insistent, persistent, ringing calling every boy to the blaze, no matter how far away, the call for volunteers, the promiscuous help, the variety, the incident that made the happening of a fire rank in the small boy's view with the coming of a circus.

WHERE LIFE STILL IS.

Such conditions still linger in some of the remoter districts. The firebell is still with them, and its call brings the populace into line to perform prodigies of valour with buckets and wet sacks, and American axes, and wet blankets. The placid, emotionless housewife, and her male counterfeit who pride themselves on never getting upset about anything, continue to hurl their neighbour's grand piano over the balcony, drop fragile chinaware from the upper windows on to the heads of the "fire fighters" below; still carefully carry the feather pillows and flax mattresses, and fleecy blankets

down the stairs lest they break. I have seen many such incidents, but two linger especially in memory. One was a fire in a coast township wherein the streets ran steeply to the beach. There was no water supply, but everyone had water barrels, and a resourceful lady, who would have made an efficient suffragette, went along the hill-top, and with quite amazing strength and persistence and ingenuity sent everybody's water-barrels rolling and crashing and splashing down the hill-side towards the fire, with disconcerting results to anyone they met as they plunged through the darkness en route, before their ill-used staves finally collapsed. In that same fire—a big one for the size of the town—the veteran officer of the local volunteers was seen scaling his chimney with a bucket, clad entirely in a nightshirt and a regulation sword.

The other incident was not very long ago. In a larger town there was again a larger fire. When one of the (volunteer) fire officers reached his home after assisting to get the fire completely under, he found a veteran city councillor from next door solemnly and noisily cutting out his plate-glass windows with an axe—in case the fire reached them.

But if we have a good fire service, it was not always so. There were times, even in Christchurch, which seems to have always been rather more fortunate than other places in many respects, when "things happened" at fires here. It is, so far as I know, the only town in New Zealand where a fire has been extinguished by beer. That is one of the reminiscences of the veteran ex-councillor, ex-Fire Superintendent, Ed. Smith, and of the still more "veteran" ex-Superintendent Samuels.

AN HISTORIC BLAZE.

Another veteran ex-fireman, Mr E. C. Ashby, also told me the other day some quite exciting things, especially the dash of the Town Brigade through the tunnel by special train in the middle of one Monday night in October, 1870. The Brigade had been practising that night, and noticed as they finished a glare in the sky, but it was taken for a grass fire. The telephone was undreamt of then, and the Port telegraphist was vainly trying to call the empty town office to electric life. A Port hotel-keeper had a horse, but refused to lend

it for a messenger to come over for help, so one had perforce to try to run through. Finally, as the glare in the sky was increasing, the Mayor of Christchurch and several councillors roused the Christchurch telegraph operator, and he discovered his worried Port confrère still sending out calls. Then the city firebells were rung and the city stationmaster was aroused for a special, only to find that "the red tape which it has been affirmed has slaughtered more Englishmen than the swords of the enemy" (I quote from "The Press" of the time) caused exasperating delay, so that when the special did get through, we read:—

"On the train running clear of the railway walls, the terrific scene in all its grandeur burst upon our view. Before us lay a veritable lake of fire, the flames leaping and hissing as if rejoicing in their deadly work; the lurid glare lighting up with Rembrandt-like colour the hills in the background, and the ships in the harbour, every yard and rope being perfectly distinct, as in the full light of day. Here might be seen whole families of six or eight little children with their mother, half-dressed, crouching behind a heap of piled-up furniture, huddled closely together for the sake of protection from the keen north-easter, which swept bitterly in from the sea. The poor little fellows raised a cheer as the train ran into the station, and they saw by the light glittering on the helmets of the men that help had at last arrived."

"THE GOOD" OLD DAYS.

Didn't I say that fires—and fire reports—are no longer picturesque? Telephones, efficient brigades, and high-pressure water, in towns of open spaces, and relatively low buildings, have squelched one side of it, and the abolition of the city firebell, and the italics of the pre-linotype days, have robbed us of the one-time emphasis that lent salt to life—and the printed fire "story." So all Christchurch aroused and clamouring vainly at a railway station for seats on the outgoing fire special, as there was that memorable night, is no longer one of the grand possibilities of an existence, which looks for its sensations to strikes and moving pictures, and the battling of black "pugs." afar. The Fire Brigade had a strenuous time then at Lyttelton. They worked right through the night and the next day, and saved what was left of the town, one of the first places to be saved being that of the man who wouldn't lend his horse. And there was another curious thing. The scribe

I have already quoted writes of the "apathy" of the Lyttelton folks, and tells how, when the Christchurch Superintendent asked the bystanders to help fix the hose they asked what he would pay them for it. "I never saw so many able-bodied men looking on with folded arms at the progress of a fire before," adds the scribe. Perhaps that is where the "We'll win with folded arms" phrase, that one heard during a recent conflagration of another sort, came from.

MANY MEMORIES.

I have had quite a sheaf of reminiscences of Christchurch fires and fire service. That evergreen veteran and public-spirited citizen, Mr Bishop, of the Gas Company, ex-Captain of Fire Police, and ex-City Councillor, is an unfailing reference on old and new Christchurch. Then there is the Minute Book of the C.V.F.B., "formed 1860," with its wealth of newspaper clippings, which Superintendent Warner produced for me from the archives at the big new Fire Station. But the greatest mine of reminiscence was opened when I got into one room, ex-Superintendent Smith's and ex-Superintendent Samuel's. Then there was a blaze!

POURING BEER ON A CHURCH.

It was from them that I grasped the full awfulness of the beer incident. The beer was poured on "the Wesleyan Chapel, in High street." It is recorded as "the first fire in Christchurch," and happened in 1859. There was no water nearer than the Avon, but Packer's brewery was near by, and a line of buckets was manned by willing volunteers, which connected up the beer barrels with the church, and which continued to move out of the brewery for quite a while before the brewery folk discovered that the fire was out.

THE FIRST BRIGADE.

Whether there were prohibitionists in those days who objected to saving the church with beer, or whether the brewer indicated that the taps would not run next time, or not, I don't know, but next year Mr Joseph Bailey formed a Fire Brigade 25 strong, with an engine presented by the Liverpool and London and Globe, nick-named "the candle box," and which still survives in rural parts. There was a firebell, too, and everyone who gave an alarm of fire got 10s. As boys tried for that bonus four or five times a day, it had to be abolished. The Brigade soon had its first big fire, commencing at Cashel House, where the D.I.C. now stands, and end-

ing at the Al Hotel. At its first big ceremony—turning the first sod for the tunnel—it turned out in gorgeous locally-made tin helmets, which weighed 2lb each, and were converted into coal scuttles when the leather helmets were secured. But they “lent éclat” (I believe that is the right phrase) to the starting of the tunnel work.

A DEATH ROLL.

Mr Smith has a remarkable set of Christchurch Fire Brigade records, which have their gruesome as well as their humorous aspects. They show that thirteen people have been burned to death in Christchurch fires, and two killed in going to them—Hellier, killed on the way to what proved to be a false alarm; Barry, who was running to the station after an alarm, when he saw the engine coming out and tried to get on and was killed. Five hundred pounds was subscribed for the widow in his case and £640 in the other, by the people of Christchurch.

Mr Smith landed here in 1864, so that, compared to Mr Samuels, he was

a comparative “new chum.” He turned out to every fire alarm from the day he arrived, and so naturally gravitated to membership of the Brigade. Everyone, he says, in those days was expected to pick up the nearest bucket, shovel, axe, or rope, and run when the firebell rang.

Mr Samuels owns to 80 years, and he was in the first Christchurch Fire Brigade, and seems to have been going to fires ever since. Yet he has had time to accumulate a family. He has been 58 years married. At a family gathering 34 sat down. There were ten daughters and one son, and with their alliances make 18 of the second generation, 36 grand-children, and three great-grandchildren, totalling 59. What the veteran remembers about fires and fire brigades would fill volumes, and with Mr Smith as interlocutor and referee, supplementing his own knowledge that is as full as it is meticulous, anyone who wanted to write a fire history of Christchurch would have abundant material at his command.



THE CHIEF FIRE STATION, LICHFIELD STREET.

CHAPTER XXXV.

FIRE GOVERNANCE.

The volunteer brigade era possessed a picturesqueness as well as an enthusiasm and a record of good work accomplished. The enthusiastic amateur has been more a record of good work accomplished. The enthusiastic amateur has been more than replaced by the substitution of the professional giving his whole time and always preparing for, and waiting for, the call (and in the matter of fire-suppression seconds count), for the amateur who, whatever his enthusiasm, had his business calls to attend to. And, then, there was the pressing call of finance for ever worrying the Fire Brigades' Association that controlled the volunteer system. The change and the reasons for it are succinctly summarised in this memorandum of Mr A. L. Parsons, manager of the New Zealand Insurance Company, and chairman of the Christchurch Fire Board, which I asked him to write for me:—

“The passing of the Fire Brigades Act was almost entirely due to requests from the Fire Brigades' Association, owing to most of the City and Borough Councils not giving their Fire Brigades the plant and accommodation they wanted and considered necessary for their efficiency. On the passing of the Act and the constituting of the various Boards which came into existence, it was found that in most cases considerable expenditure had to be made for plant and new stations. The result has been that the cost of fire-prevention in cities and boroughs which are governed by Fire Boards is considerably greater than when in the hands of the municipal authorities. The efficiency of such brigades is, however, much greater, as they are supplied with modern and efficient plant. Formerly, the work of the brigades was carried out largely by volunteers, but in all principal brigades controlled by Boards there are now a number of permanent men living on the station and available day and night. This accounts for a good deal of the extra annual cost of the brigades.

“In the old days it was necessary to ring the firebell to call the volunteer members of the brigade from their work or their homes. With the whole staff residing on the station this is not now necessary—hence the firebell is no longer heard in Christchurch.”

THE FIRE BOARD.

Mr Parsons adds:—“The constitution of the Fire Board is one member appointed by the Government, three elected by the city, and three by the insurance companies, and the necessary funds are provided—£200 by the Government, balance equally by City Councils and insurance companies. Estimate is made in each year of probable expenditure, and on this being approved by the Minister of Internal Affairs, levy is made as above, in quarterly payments.”

The Christchurch Fire Board consists of Messrs H. R. Rusbridge (Government representative), H. Holland, A. Williams, and W. H. Cooper (representing the City Council), A. L. Parsons (chairman), W. B. McKenzie, and J. F. Grierson (representing insurance companies). Mr C. J. Treleaven is the secretary. The Board meets every second Tuesday in committee, and every second Friday in open meeting. The insurance representatives represent twenty-seven companies doing business in Christchurch, and jointly in 1913 they contributed £4400 to the total of £9000, which represents the cost on the estimates of the Brigade for the year ending June 30th, 1914. The City Council finds a like sum and the Government its £200. It is, as Mr Parsons points out, a bigger cost than under the old system, but it has much more than saved itself in the increased efficiency resulting in the cutting down of fire losses.

THE FIGHTING MEN.

The Fire Board assumed charge on July 1st, 1907, but it was not till July 1st, 1908, that it installed its first “permanent” fire-fighting staff. The Brigade consists of twenty firemen and four officers. The latter are Superintendent Warner, Deputy-Superintendent Blake, Foremen Davis and Hazard, all at the headquarters in Lichfield street. Then there are the Sydenham and St. Albans stations, each with a foreman in charge. There is also an “auxiliary” staff of twelve “partially paid” firemen. It is usually twenty. They receive a retainer of £20 per annum, and live in the station, where there are twenty-seven men in residence, with four at Sydenham and five at St. Albans. Per-

haps the most striking difference between the firemen of the new regime and of the old is their youth. Instead of the mature and be-medalled firemen, heroes of many a blaze and stars of many a competition, whom one was wont to see in volunteer days, there are now manning the stations chiefly young men in their early twenties. The volunteer firemen were usually tradesmen, and business men, many of them with large personal interests in the town that they were helping to protect. The firemen of to-day are largely young sailors. The world over, men with a sea training are esteemed the best material for fire-fighting—that for many reasons, including their handiness, their agility, and their amenability to discipline. The Superintendent was himself a sailor of wide sea experience. He was appointed to Christchurch while occupying a similar position in the Palmerston North Fire Service. There, he came with credit through a literal “ordeal of fire,” when the elusive, and now vanished Powelka fired the town. Powelka fired two big places in the one night—one a mercery store in which he outfitted himself while the populace was attracted to the burning of the High School a little out of the town, which he had previously fired. And under cover of the second fire he got away. There was a third fire at the same time, but whether he had anything to do with it is not clear. He said not. It was a coincidence. At any rate, those three practically simultaneous fires, and a whole series of fires that followed from emulators or folk anxious to avail themselves of the opportunity were a good test for a fire superintendent’s nerve, and the present Christchurch Superintendent came well through it. At twelve, Mr Warner joined the Trinity House Navigation School for three years, followed by five as an indentured apprentice at sea. And after serving this, he put in another five years under sail and steam before coming ashore to

join the Wellington Fire Brigade in 1902, rising through the grades steadily till his Palmerston appointment in 1908. The Deputy-Superintendent has been over fifteen years in the Christchurch Brigade.

WHAT FIREMEN GET.

Firemen get free rooms, light, bedding, and furniture, and their pay starts at two guineas and rises to £2 12s 6d, after the second year’s service, and they get seven days’ holiday on full pay annually. They have most comfortable quarters, with a large club room, billiards, gymnasium, library, etc., and they have a system of catering for themselves—that is the single men, the married men live in the two-storied cottages provided behind the station, and no doubt their help-meets are their caterers. But the single men have a mess, and their own cook, who caters, one of the senior men keeping charge of the accounts. Every fortnight the cost is worked out and divided. The last fortnight it worked out at 11s per week—and they have all hearty appetites that are liberally satisfied.

THE FIRE FIGHTERS’ DAY.

For the first six months of their engagement the men are on probation, and they are given a course of training with the various appliances, physical drill, first aid, etc. The Christchurch fireman’s day begins (when fire does not call him out earlier) at 6.45 a.m. in summer. Till eight o’clock he is busy about the station, keeping it to that condition of cleanliness and polish that is a feature of the up-to-date fire station, testing automatic fire alarms, and so on. All the painting, carpentering, blacksmithing, sail-making, patching, mending, and plumbing for the Brigade is done by the members themselves, who have well equipped workshops for the purpose—and being “handy men,” do the work well. Only really “big jobs” are given out, jobs beyond the capacity of the “plant.”



CHAPTER XXXVI.

THE CENTRAL STATION.

THE FIRE STATION.

I have already said that the new Christchurch Fire Brigade headquarters in Lichfield street is esteemed the finest and largest in Australasia. I have heard "South of the Line" claimed, but am always chary of those "South of the Line" comparisons, because I am not personally familiar with the big South American cities; and the way they lavish money on what they want, makes "South of the Line" comparisons rather risky when you don't know. But "Australasia" is safe. The station covers an acre of ground, and we know that no other in Australasia has anything like that ground space, and as it is also the latest, it has had the advantage of the experience of all the others in arrangement and equipment, while the spacious site has enabled things to be adjusted in a way that a limited site would not permit. In the number of firemen, of course, the bigger cities of Australia and South America would lead, but not in the arrangements to ensure the efficiency and comfort of the men, and the proper housing and care of the plant. We have the world's best among appliances, whilst the locally invented and manufactured Simplex automatic fire alarm system, upon which the Christchurch fire system is based, is a "world beater," and there is another local invention in the Vigilant fire alarm, which connects private concerns and the Government buildings, that won the Government installation against the most famous of other rival systems purely on its merits.

JUST TEN SECONDS.

To see a turn-out of the brigade from this station would be an eye-opener to the average citizen who takes everything for granted in the "familiar unknown" of his city life. There is such a one every day, whether there is a fire or not, as a test of efficiency, so as to keep men and plant at concert pitch, and one I saw on my visit brought about at my desire to see just what the drilling and the preparation had accomplished, showed just where matters stood. From the time the button was pressed till the three motor engines were racing along the street, was exactly ten seconds. In that time the men had run from rooms, slithered down poles, got into their uniforms, manned the motors, taken their places

on the engines, and swung out through the automatically opened doors. It takes a lot of work and thought behind to accomplish that sort of thing, and a lot of heart enthusiasm in those responsible. Yet you sometimes find folk, who, having failed to give the alarm till the fire was well on, growl that "the Brigade wasn't there quick enough." Such men should just see once what happens when they do break the alarm at the nearest fire post, and press the button that sets the whole of the elaborate Simplex system in motion throughout the station, and (if at night) turns on the lights in every married man's house and single man's cubicle, in the engine-rooms, and in the passages and yards, so that the men turning out hot-foot will see their way as they run.

IN LICHFIELD STREET.

The solid new brick structure of which Mr Barlow was architect and Messrs P. Graham and Son builders is one of those places which suggests brains and practical adaptation of means to a definite end in every portion of it. First there is the spacious engine room, with its imposing array of three motors, two steam fire engines, hose, ladders, etc., every bit of metal gleaming. To the right is the watchman's room with its electrical marvels, the battery room, the dynamo. To the left the Superintendent's office, the Board room, the downstairs portion of the Superintendent's quarters. At the back of the engine room three single men's rooms, store room, well-fitted single men's lavatories and bathrooms, three washhouses, kitchen, single men's dining-room. Across the yard are six two-storied residences, also in brick, each of five rooms, and all fitted with every convenience, and with their own yards. These are the married men's quarters. Upstairs, immediately over the engine room, is the Social Hall, 48 x 35ft, with billiard table, piano, card tables. Folding doors enable it to be converted into one big room with the gymnasium (20 x 34) where physical culture classes are held and much work is done. Off the gymnasium is the library. On the western side are the Deputy-Superintendent's quarters, with the motor-man's quarters next them. On the eastern the Superintendent's quarters. On this floor, too, are the remainder of the single men's rooms. Altogether there are 15 single men's cubicles, with

accommodation for 27 single men. There are two coal houses on the top floor with elevators for the married officers' quarters, and all the quarters upstairs have access to the gymnasium, where are the poles down which those who dwell aloft slide at the note of the alarm.

In the yard there is a single-storey building (like all the rest, of brick) wherein are repair shops, paint shop, carpenter's shop, smithy, petrol store, etc. As I have already said, all but the very biggest work is done on the premises, and it is not surprising that there is ability to do it when the previous occupations of the men are enquired into, for besides the sea-trained "handy men," there are engineers and tradesmen in the Brigade personnel.

"THE SIMPLEX."

To me the most remarkable of the many interesting features of the station is the watchman's room, wherein, instead of sitting on top of a ladderlike scaffolding, as the watchman of old did, he sits calmly on a chair at a beau-

tifully constructed switchboard of marble and brass and wire, whereat he gets a greater outlook on the city than the old system could ever have provided. You have seen the fire alarm glasses at vantage points in every street. Run to that directly there is sign of fire, break the glass, and press the button, and instantly the call is recorded on the switchboard and the exact location of the caller. Instantly the whole machinery of the Brigade and the station is set automatically in motion as I have described, and in an inconceivably short space of time, measured by seconds, the engines are racing to you—racing out before a firebell could have more than changed a note. What has happened is that as you pressed the button a shutter has dropped and the clock-face on the switchboard has indicated the number of your alarm station. The watchman has assured himself by lifting a telephone receiver through which he can hear your gong ring that it is not a false alarm, and all the station bells have been rung, pilot lights lit, and all the other operations



THE WATCHMAN AT THE CHRISTCHURCH STATION BOARD OF THE WONDERFUL SIMPLEX FIRE ALARM SYSTEM, MADE BY THE SIMPLEX FIRE ALARM COY., 84 HEREFORD STREET, CHRISTCHURCH.

of which I have told you have taken place. This switch-board is in itself a marvel of brains and mechanical ingenuity. It is a telephone bureau as well as all the other things. At the back there is what looks like an absolute maze of 60 miles of the best Silver-town electric wires. To make that cabinet 10ft by 9ft and weighing $1\frac{1}{4}$ tons, 10,000 separate pieces of metal, each with its special function, had to be machined, and nearly 2cwt of brass used and 14,000 holes drilled. It provides for 24 circuits, of which 16 are in use with 89 alarm boxes, and it is to the fire system of Christchurch what the wonderful conning-tower fittings of H.M.S. New Zealand are to that battle-cruiser. Yet, complicated as it seems and sounds, it is so simple that a child could work it. And the whole thing was evolved by Mr Moss, in his "factory in a garden" by the riverside at Dalington, where, too, has just been perfected a "roof control," for automatic fire-alarms, now fitted at Wood's mills, that is so uncannily prescient that it adjusts its system to the weather, and alters its gearing automatically on a sunny day or a cold day, and where, too, there has just been evolved a new automatic franking machine that represents seven years of evolution, and leads the world. In delving into the Familiar Unknown one may discover such things in Christchurch with possibilities that, with capital, would make it a world's centre.

STILL ANOTHER LOCAL WONDER.

And the Simplex system is not the only local marvel at the brigade station. Ex-Superintendent Smith has an ingenious fire-alarm invention of his own working there among the different private alarm systems that centre in the watch-room, and there is also the invention of Mr M. Moloney, a clever mechanist of the local Post and Telegraph Office, the "Vigilant" thermostat alarm system, manufactured locally, also—by Brown Bros. It won out in the competition of systems for the Government buildings in Worcester street, and it embodies an ingenious new principle. Not only is it being installed ashore, but it is being installed afloat on steamers. It is a "thermostat"; which indicates each rise in temperature but if the rise is only momentary will readjust itself and indicate that at the watch-room of the fire station. All this is accomplished by what looks like a slight rod electrically connected, which will indicate fire in any part of a big room or building, and give the alarm at the fire station, or which may be carried from room to

room of a house and give the alarm by ringing its own bells, if the children upset a candle and the curtains in their room catch. All these things are the products of ingenious Christchurch brains, and there are Christchurch brains working at inventions of all kinds, that only want intelligent encouragement and financial help to some-day develop an Edison.

THE FIRE PLANT.

The fire plant consists of a motor chemical engine, a motor fire engine, motor ladders, and two steam fire engines, at headquarters, with the necessary hose plant, etc. Horses have been completely abolished, and when there is a fire where the water pressure is not sufficient, the motor engines take the steam fire engines out with them much more surely and speedily than the once dashing teams of Fire Brigade horses used to do, while the difference between keeping a motor in order and attending to horses in a station is obvious, as well as the cleanliness of the new order. At Sydenham and St. Albans branch stations there are also motor chemical engines available, and at Chester street a steam fire-engine and a motor hose-waggon. At headquarters there is a "smoke helmet" and jacket. It makes possible entrances to buildings to save life or property that otherwise could not be saved, but the Brigade will soon have a still more up-to-date one in the Simonis smoke helmet, which simply rests on the shoulders and leaves the arms perfectly free, and is worked by a small bellows under the wearer's control. With it it is possible to go safely through smoke and deadly ammonia and chemical fumes resulting from accident in a freezing works or the hold of a steamer. In fact, the local freezing works are equipping themselves with them since one happened to be opportunely available on an accident call when Mr Simonis was visiting the fire station here not long ago.

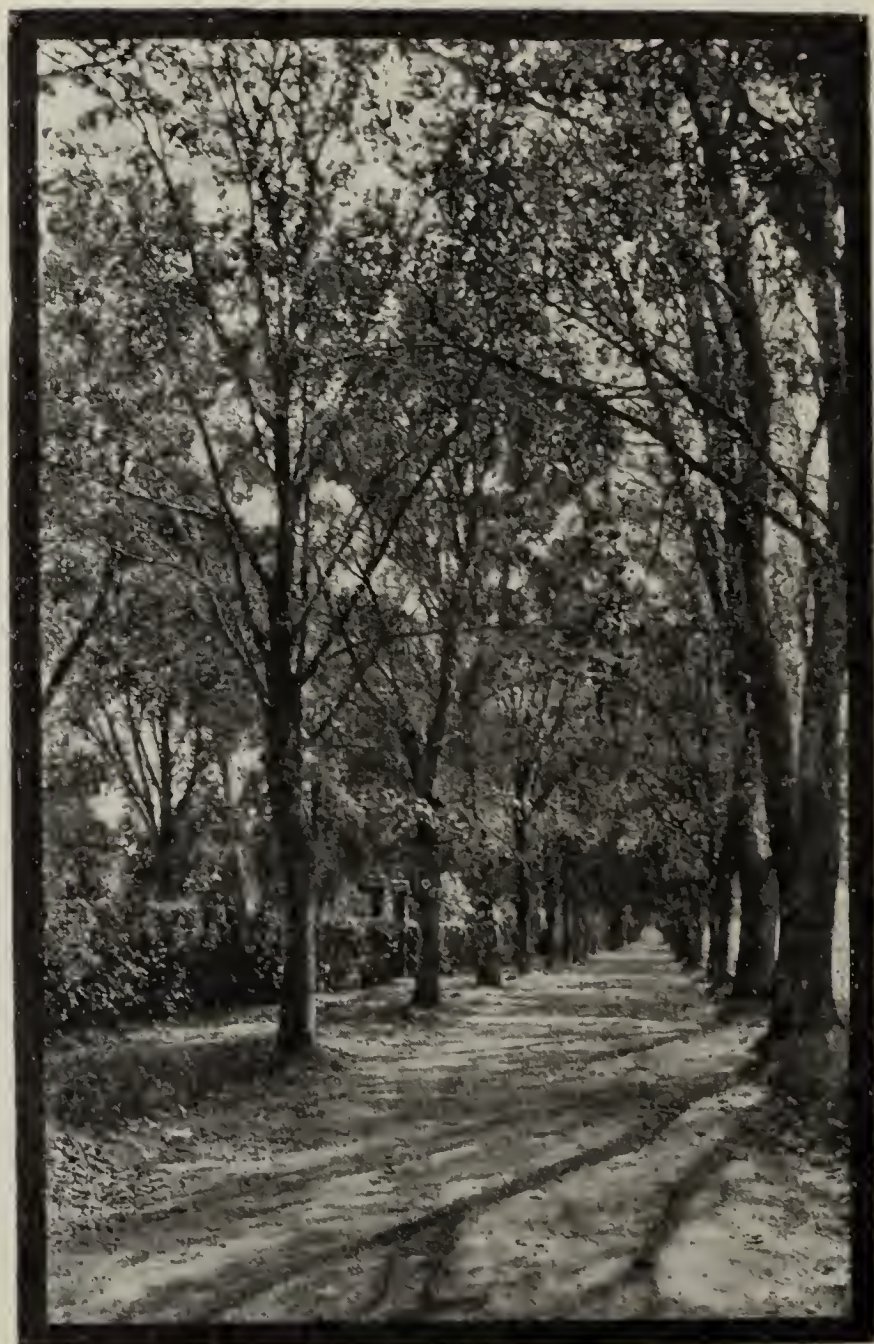
WHAT THE BRIGADE DOES.

We are happily not participating in the sort of fire epidemic that is afflicting Sydney and Melbourne just now. It is consoling to know that if it does come we will have a better chance of coping with the fire bug than those cities. Yet the Brigade is called out oftener than most folk think. In the last six months, for instance, it was called eighty-five times. Thirty of the calls proved to be false alarms, nine were for chimney and rubbish fires, forty-one were actual fires within the

city area that the Brigade guards, and five were calls from outside. Of these calls, forty-nine came over the Simplex system of street alarms, twenty-nine through the telephone exchange, six were by messengers, and one was per private automatic alarm. Eleven of the fires were in private dwellings, the rest in various business and manufacturing premises. Five of them were caused by children playing with matches, four by incendiaries, three by smoking, three by sparks, two by kerosene lamp explo-

sions, one by spontaneous combustion, one by electric wires fusing, two by careless vagrants. Lighted candles, motor back-firing, hot ashes, faulty stove pipe, fat boiling over, beeswax boiling over, were among the causes of single fires, and in seven cases the origin was unknown.

But whatever they were and however they were caused, the Christchurch Brigade and its plant was found capable of efficiently coping with every emergency that arose.



IN ROLLESTON AVENUE.

A WORLD-FAMOUS CONCERN.

There are a few concerns in the world whose reputation is world-wide, whose name is in itself a standard and a guarantee of the world's highest in the quality of whatever they specialise in. One of these has its New Zealand headquarters at 165 MANCHESTER STREET, Christchurch. Its head offices and warehouse at 100 to 106 Cannon Street, London, E.C. Its works at Silvertown, London, E. Its far-flung branch establishments march with the Empire, and far beyond even its world-wide confines—over into France, into South America, and everywhere throughout the rest of the world—where there are not established branches there are dealers in their goods. It is one of the few real cosmopolitans of industry. Wherever India-rubber and gutta percha is used in its myriad forms, wherever there is electrical application, there the sign manual of "Silvertown"—the trade name of "The India-rubber, Gutta Percha and Telegraph Works Ltd."—is known and sought.

Myriads on the face of the globe begin the morning by standing on a Silvertown bath mat, and sluicing themselves with a Silvertown rubber sponge or flesh glove. They read the cables in their morning paper, brought them beneath the sea by Silvertown cable, they motor to their offices on Palmer Cord Tyres of the Silvertown Company, step out of the car on "Gray Silver" rubber heels, sign their morning mail with a Silvertown fountain pen, seek refreshment from a Silvertown rubber stoppered bottle, send out their merchandise in a Silvertown electrical delivery van, ring up a friend when the rush of the day is over on Silvertown telephone wires regarding a telegram received through Silvertown instruments, and end by engaging to meet him on the golf links and play for a box of Silvertown balls.

The story of the growth of this enormous business, and the combination of organising genius, probity and financial and industrial ability that have made it what it is, would take a volume for the telling. In 1852, S. W. Silver and Co., well-known outfitters in Cornhill, removed their waterproofing works from Greenwich to an acre of land between Bow Creek and Barking Creek. Seven more acres were added. That was the beginning of Silvertown. It so grew that it gave the name to the district it created. Now the works occupy over 17 acres, have special water and rail carriage with the whole world to bring in raw material and send out finished goods. Silvertown has become a large town, and West Ham, created a Borough fifteen years ago, has 300,000 people—more than three times as many as Greater Christchurch. In fact, the population that has grown up around the works is equal to that of the four chief cities of New Zealand combined, and the works themselves employ over 4,000 men at Silvertown, 800 at Persan. in France, and I do not know how many elsewhere.

That is why the people of Christchurch have good reason to be glad that Christchurch was chosen as the New Zealand headquarters, and that the wonderful resources of the world-famous "India-Rubber, Gutta Percha and Telegraph Works Co. Ltd." are at their disposal at 165 Manchester Street for the carrying out of detail in their great Coleridge scheme.

How great is its capacity to help them they can ascertain by calling upon Mr. G. B. Cromb and his staff, and seeing and hearing for themselves.

To facilitate the working of the Lake Coleridge supply scheme a large special showroom is being established at the Manchester Street establishment for the display of every kind of electrical and lighting requirement of the citizen when electricity is at his hand. There are, for instance, the American "Hot Point" goods that you see advertised in the American magazines. You can have a hot point that you simply dip into your shaving water and it will boil it, you can cook on your breakfast-table or in your drawing-room, if you like, so neat and clean and handy is everything. Then there are the beautiful Silvertown radiators for electric heating, effective as well as decorative, the electrical fans, the electrical fittings and lamps made by the famous firm of Peyton and Peyton for the Silvertown Company, the last word in art work of its kind. All this and more the showroom will have to reveal as a perennial exhibition of practical applied art and electrical convenience.

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Christchurch—The whole of the tramway electrical plant, turbines, switchboards and car equipments.

Westland—The whole of the electrical equipment, including electric locomotives at the Westport-Stockton Colliery.

Lake Coleridge—The transformers, insulators and lighting arresters.

Wellington—The whole of the tramway car equipments.

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Te Aroha—The new generating plant now being installed.

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